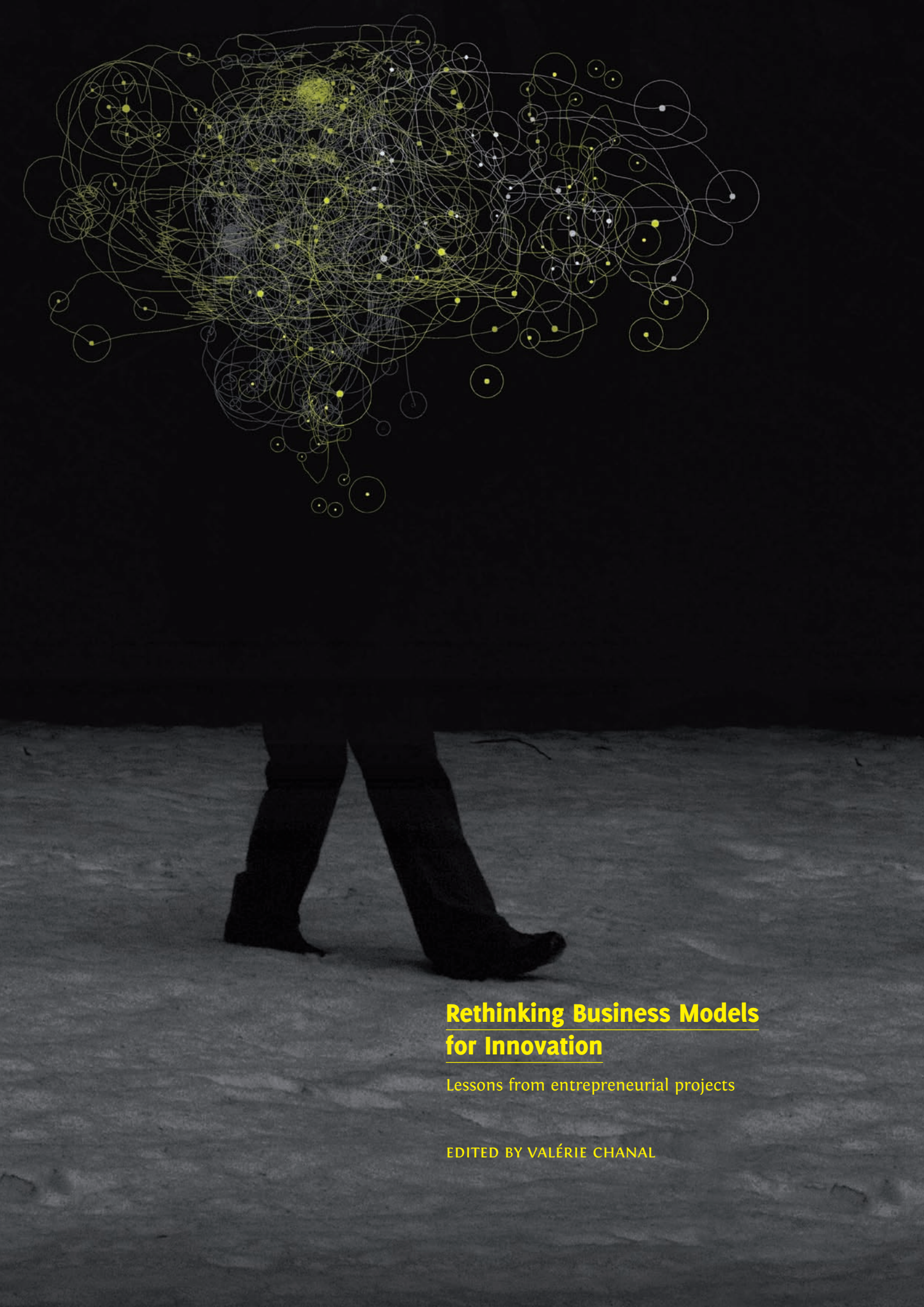
Rethinking business models for innovation

Valérie Chanal, Sigmund Akselsen, Sylvie Blanco, Marie-Laurence Caron-Fasan, Bernard Cartoux, Bérangère Deschamps, Markus Eurich, Jean-Marc Francony, Yukiko Fujimoto, Gilles Garel, et al.



Rethinking Business Models for Innovation

Lessons from entrepreneurial projects

EDITED BY VALÉRIE CHANAL

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FOREWORD

Innovation: a Must to sustain profitable growth in a global competitive world

Philippe DELORME
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In today's increasingly global, complex and competitive world, companies looking for profitable sustainable growth need to constantly invent new competitive advantages. Innovation brings differentiation, and differentiation is essential to lasting success.
Innovation has many facets, often underestimated, which are not limited to the notion of technological innovation and R&D.
Technological innovation itself can be a fantastic enabler, as in the case of renewable energy providing green electricity or biotechnologies bringing new medical treatments to market. It can also be an extremely efficient driver bringing down the cost of digital cameras or reducing supply-chain costs thanks to new ERP software.
Innovation, however, is also about people and how they work together. It is about customers and how lasting relationships are built, about industrial facilities and how they operate and share best practices. And of course, innovation is about R&D teams and how they come up with new, but most importantly market-valued technologies, products and solutions.
All of these elements are vital in turning technological innovation into value, and must be brought together through the Business Model framework.
The Business Model is in a way the company's pragmatic translation of its ambition and its strategy to achieve it. It is also about ensuring that innovation brings value to the company, to its employees, customers and partners as well as to its communities and the environment.

This compelling book explores the link between innovation and Business Models in many different situations: from emerging to mature markets, from recent technologies to proven solutions. In each case, the authors combine real-life examples with business theory, providing us with a great reading and learning experience.

Innovation is a fascinating topic. There is no single universal recipe. It is built from experience and experimentation, from successes and failures, by smart and pragmatic people. These people must be able to adapt what works well to new contexts or leverage new technologies to respond to hitherto unthought-of needs, adding value through their individual and differentiating touch.

This book will surely help both entrepreneurs and 'intrapreneurs' along this path.
Happy reading!

Acknowledgements

This book is the result of a collective project carried out by the Umanlab research laboratory, part of the Grenoble University (France), and involved a team of researchers in social sciences and innovation specialists.

Over three years we carried out research in various companies around Grenoble, in the Rhône-Alpes region of France, and have confronted our views and tested our methods in numerous projects and seminaries.

We would like to thank the managers and directors presented in the book for the important roles they have played in making the project possible and for the collaboration between the Umanlab researchers and their teams in order to work closely together on the particularly sensitive subjects of innovation and their Business Models.

We would also like to thank those organisations who have supported the work of Umanlab, financially or otherwise, along-side the French Ministry for Higher Education and Research: Grenoble Pierre Mendes University, the CEA and the Grenoble Institute for Political Studies as well as the Grenoble Ecole de Management and the Grenoble National Polytechnic Institute, the "Management and Organisation of Production and Innovation Systems" research cluster of the Rhone-Alpesw region and the Grenoble Stendhal University.

Finally, a particular thanks to all those who have worked on the finalised content of the book, in particular Andrew Chisholm (editorial harmonisation and translation into English), Jean-Marc Francony (editing and Web-site), Yann Montigné (graphic design).

We hope that the result of this work will provide proof of the interest of this type of collaboration in helping researchers and innovation specialists work together in imaging, developing and testing new tools and methods to take innovation management forward.

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Contents

INTRODUCTION

Why we need to rethink Business Models for innovation

Valérie Chanal (University of Grenoble)

Apple, Google and Amazon, giants of the IT and the Internet are often cited as references in the today's world of innovation. We praise their capacity to associate technological innovation with design, a strong brand, process innovation, services and above all their innovative Business Models. The classical vision of linear innovation processes, either based on market needs (market pull) or on technological innovation (technology push), gives place to a more systemic vision where the business ecosystem supports the emergence and diffusion of original value propositions.

The notion of Business Models, when applied to innovation, enables us to describe how a company creates value through innovation, generally in interaction with other companies, and how the value will be distributed between the actors involved. The authors of this book believe that the notions of Business Modelling and value creation are key to all the dimensions of successful innovation, whether technology, marketing, organisational or economically based.

In the 1980s, Teece, who developed the "Profiting from innovation" (or PFI) model, introduced the notion of complementary strategic assets in order to show that a technology wasn't sufficient to guaranty a high enough level of profit unless accompanied by other strategic assets (for example a brand, production capacity, or a distribution network). In 2006, he added a key element to the PFI model, the Business Model, to create value from the innovation work of companies: *"I have come to recognize that getting the business model right is important to the innovation process and to business performance more generally" (Teece, 2006)*.

Today, the innovation boundary has moved towards projects that are more exploratory and fuzzier. The simple optimisation of linear processes of the "stage-gate" type is no longer sufficient to build sustainable competitive advantages. One of the major challenges confronted by those in charge of technological innovation involves anticipating the value creation model sufficiently early on, in a highly uncertain context both as far as the technology itself is concerned and the potential markets.

The question of value is even more critical in today's fast moving world as shown by Chesbrough (2006) in his description of innovation as an "open" process. Innovation is now open both upstream, through the integration of technologies developed by others, and downstream, creating value from technologies outside the company's traditional markets.
Obviously, as underlined by Chesbrough (2009), there are cases where the technology can be sold through the company's existing Business Models or sold to others via licenses. However, in most cases, thought needs to be given to the Business Model that will enable the company to optimise the potential of the new technology, or service. This is obviously the case of start-ups, who don't have existing Business Models and have to invent their own. This, however, can also be the case for existing companies. Research into new performance levels, for example involving selling global solutions, often requires companies to experiment new ways of doing business.

A mediocre technology pursued within a great Business Model may be more valuable that a great technology exploited via a mediocre Business Model. (Henry Chesbrough, 2009).

Business Model case studies "underway"

References to these multinationals that have successfully re-invented their Business Models are both stimulating and frustrating. Practitioners in charge of technological -innovation obviously find themselves in the position where they say "I'm not Apple and I'm not Google… and …am I really concerned by all this stuff about Business Models?"
Far from these retrospectively reconstructed success stories, this book aims precisely to show that, yes, thinking about Business Models in a context of innovation does apply to all types of business, whether they be start-ups or established companies.
Based on a number of recent case studies of involving technological innovation, we'll develop the main issues around Business Models and show how companies have dealt with them using a number of methods, concepts and tools.
The Business Model is used here to structure thought processes, as a model in the full sense of the term. The Business Model helps define the future value of an innovation and is an ideal tool to help convince strategy makers and stakeholders (both internally and externally) as well as to compare a chosen strategy with those of the other players in its sector.

Business Models are representations that allow managers to articulate and instantiate the value of new technologies (Perkman and Spicer, 2010)

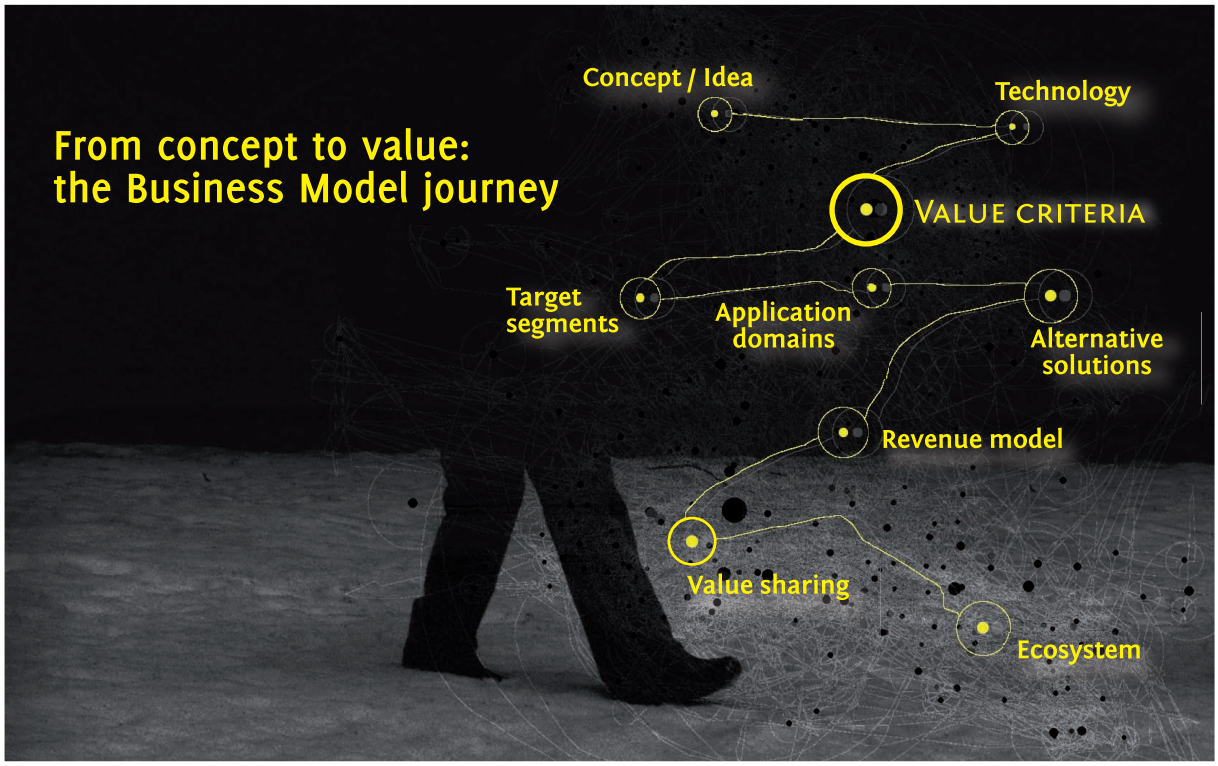
This book is based on the most recent advances in research into Business Models, the references of which are to be found in the bibliography. We note in particular the special issue of Long Range Planning in 2009 and the M@n@gement journal in 2010 (Lecocq and al. 2010) as well as the work of Teece and Chesbrough, or in France, work on entrepreneurship carried out by Thierry Verstraete and Estelle Jouison.
The book also builds on a number of excellent recent articles and manuals on how Business Models are developed such as those written by Alexander Osterwalder and Yves Pigneur (Business Model Generation, 2009) who present the bricks of Business Models and how they are inter-related in a very visual and easy to understand way. However, as Chesbrough (2009) underlines, *"Tools, such as mapping, are useful to explicate business models, but cannot by themselves promote experimentation and innovation with those models"*.

Rethinking business model for innovation: this title describes the relationship between thinking, modelling, and also field-testing. The book is based on a series of recent cases of innovation involving company managers, often assisted by researchers (the co-authors of each chapter), and how they built and formalised their Business Models and then tested their strategies.

It is in times when it is clear that the old business model is no longer working, that business model experimentation becomes so important. But it is not at all clear what the eventual new business model will turn out to be. Only experimentation wan help identify it and create the date needed to justify it. (Chesbrough, 2009)

The cases developed in this book reflect on the experimentation logic inherent in new Business Models. Usually, companies progress through repetitive experimentation, the main characteristic of the exploration process. The analytical framework provided by Business Models associated with the approaches and tools presented can help structure the exploration phase.

Fig. 1. The Business Model Journey



A GLOBAL APPROACH THAT TREATS SPECIFIC COMPANY ISSUES

Business Model design is a key step for all technological start-ups. They all have to convince stakeholders that their technology will be able to create value and result in a sustainably profitable business.

In **chapter 1**, research into the work of the GR.A.IN incubator (a nationally funded incubator whose aim is to support spin-offs from public research in Grenoble, France) has shown that business creators are often ill equipped to work on the business and market related aspects of their projects, with all the resulting strategic implications. At best they consider the target markets for the technologies that they've developed, but with the exclusion of numerous others aspects such as the resources and competencies to be developed, partnerships to be set-up, or analysis into the highest potential positions in their economic sector. It's therefore vital to see how these business projects can be best assisted, whilst respecting the pragmatic trial and error approaches observed in other successful start-ups.

All the cases presented in the book illustrate how companies pose the Business Model question during **exploration projects**. Here, the term exploration concerns projects where the aim is to produce knowledge in a fuzzy context i.e. a new architecture, an original idea, the implementation of a new strategic vision or the concept of a new offer still at the unclearly defined phase. In these exploration phases, the company will attempt to define one, or several, potential **Business Models**, in other words it will define **how value will be created** and also **how value will be shared** between the actors who contribute to making it available. Numerous ways of describing Business Models have been defined, notably including that of Osterwalder and Pigneur (2009), the 9 brick " Business Model canvas". Whilst respecting this structure for the most part, the chapters in this book build on the following three issues: the identification of sources of value and revenue models (the notion of value creation), the position of the company in the value-network or ecosystem (the sharing of value) and finally the evolution of Business Models over time (the sustainability and the competitiveness of the company).

Identification of sources of value

Three chapters deal more particularly with the question of sources of value. **Chapter 2** develops the case of Axane, a subsidiary of the Air Liquide group, which describes the exploration of potential business areas and applications based on a given technology. The case covers the issue of finding opportunities and innovative applications around the technology of hydrogen powered fuel cells. It describes the approach used to bring to light the useful effects of the technology in a previously unexplored area, namely the world of film-sets.

The application areas for an innovative technology require that first potential segments be identified and then target segments selected. The case of Microoled in **Chapter 3** shows the trajectory of a company aiming to develop a technology for OLED displays. The company cannot address all applications and all sectors, so has implemented a pragmatic approach to select target markets, both geographical (Japan in this case) and based on potential uses (smart glasses in sport).
Identifying target segments and client value criteria enables us to describe what value the innovation can provide for the targeted customer segments, i.e. to formulate **value propositions** for clients.
The formulation of the value proposition involves moving from a, more or less advanced, concept definition, through to the identification of application areas and target segments and finally a set of criteria to identify values that differentiate their offer from the market.

In some cases, those who use the service are not those who pay. This is particularly the case in Web based services where users are used to not paying. The Sportganizer case, described in **chapter 4**, shows how a web platform targeting sports clubs provides an original model for funding through sponsoring by making a new value proposition for the other side of the market (made up of sports equipment providers).

The position of a company in the value network

The identification of value criteria for target markets allows companies to progress on the notion of value created by their technology, application or service. From the information obtained they can identify clients for whom their innovation could potentially provide value.

From this point, it becomes necessary to map and simulate the **value network** as it could be to deliver the offer. According to Porter (1986), the value chain describes the activities that enable a company to deliver value to its clients. Value creation is generally provided by several organisations so the approach we adopt is that of the extended value network, a notion that is close to the economic vision which distinguishes between activities undertaken by a company and those that can be undertaken by others. This is the beginning of the process of looking into potential alliances and partnerships, more specifically in situations involving co-innovation.

Chapter 5 describes the experience of Eveon, a start-up in the pharmaceutics industry. It shows how Eveon succeeded in finding its position in a highly competitive sector with large established international players. It's not the intrinsic value of the technology that's important here, but rather how the company captures value from its technology, by offering a global service from design through to distribution.

When compared to the linear representation of value chains (or sectors), the notion of **value network**, borrowed from Brandeburger and Nalebuff's co-opetition model (1996), adds the dimensions of competition (direct or indirect) and suppliers of complementary services. The value network has the advantage of identifying sources of competition and value capture over and above what can be identified through the value chain itself.

This leads to be able to analyse the revenue generation logic and the way in which value is shared across the network: who will pay for what and how (fixed sum payment, on an as use basis, by the client user, by another party etc.). From this point economic simulations can be carried out based on market hypotheses and existing actors (and their reactions). This is described in **Chapter 6** which describes Schneider Electric's experience in the deployment of a new strategy. The company has developed a device to improve the energy efficiency of air conditioners in buildings. The case illustrates that if the company had implemented a classic Business Model, it would have captured a very small part of the final value of innovation. Here the innovation Business Model is geared towards increasing the value captured by the company.

The evolution of Business Models and their anticipation

Most of the cases studies used very pragmatic approaches; the companies experimented on the basis of a first Business Model, then as necessary evolved in order to capture more value. In the same vein as Eveon (chapter 5), Prédictys **(Chapter 7)** shows how a small company can succeed in a very competitive sector, that of e-publicity, by starting with a classical intermediary information Business Model and progressively moving towards that of a fully integrated web agency, providing complete services, through building distinctive competencies.

This wasn't the choice of PX Therapeutics, a start-up in the bio-technology sector **(Chapter 8)**. Instead of moving, sequentially, from one Business Model to another, the company chose to build a portfolio of Business Models in order to balance its activities and so manage strategic risk. It is interesting to note here that the logic of having a portfolio of Business Models is not specific to large companies and can be implemented successfully by a very small company. Finally, the Chapter 9 case involves a European R&D consortium whose aim is to develop technologies for the Internet of the future. Here, the subject involves seeing how each participating industrial company in the consortium can be assisted in anticipating the Business Models of the future based on scenario and through simulating the ecosystems specific to each technology deployment scenario.

The notion of **ecosystem** is broader than that of the value network and enables a company to be analysed in an evolving context. Inspired by the metaphor of a biological ecosystem, Lansiti and Levien (2004) consider that innovation requires a favourable ecosystem to be deployed. The ecosystem represents all the stakeholders with whom a company has relations.

These stakeholders include opinion leaders, prescribers, or standards organisations and others who can have an impact on the future of the innovation. This concept applies perfectly to advanced technologies being explored such as those described in this chapter.

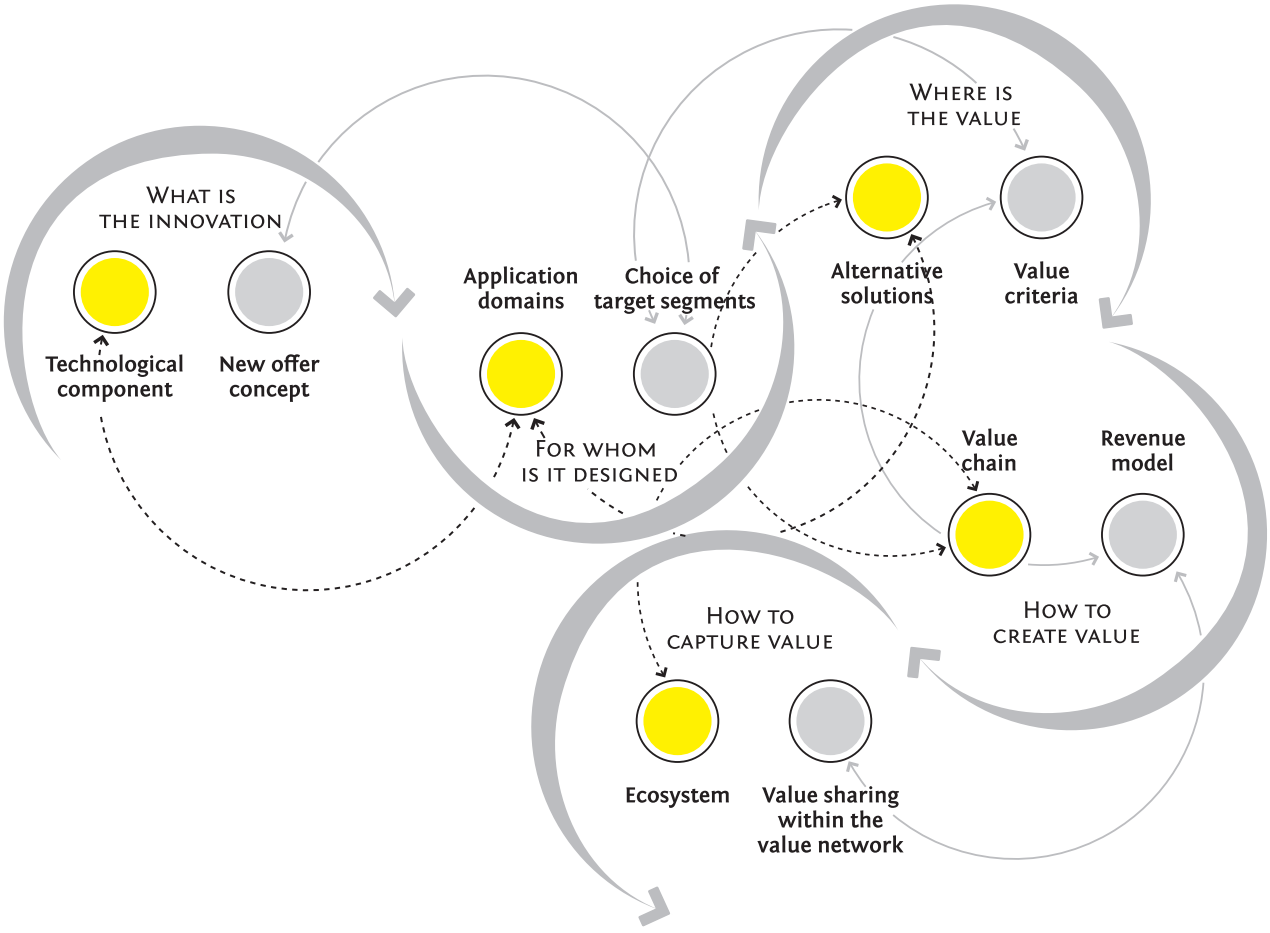
Finally, **Chapter 10** goes over all the contributions, exploring the notion of value. The idea of value is central to Business Models but is paradoxically much less well defined in literature. The notions of value creation, value proposition, value sharing, and captured value are talked about but often without defining what is meant by value. This chapter compares the visions of an economist and a marketing specialist, first dissecting and then explaining the concept of value.

The reader will understand that every innovation situation generates specific questions about Business Models. However, we feel that we can identify key issues that arise, more or less, in each of these projects. The diagram below summarizes the major issues addressed through the various chapters of this book.

Generally, the starting point of exploration is either a technology brick, or the basis of a concept for a product or service. Exploration involves identifying application areas and more finely targeted market segments. The comparison of the proposed

innovative solution with competing solutions in the user contexts of targeted clients allows value criteria to be imagined. These in turn are the elements that the client is likely to value. At this point we can formalize one or more value propositions. From here on, the company can start to make assumptions about the revenue model and the organization of the value chain to deliver the value proposition. The next step involves identifying the key actors in an ecosystem conducive to the innovation and then modelling the distribution of value within the network to prepare the operational business phase of the innovation. All of this is, of course, done over time with frequent back tracking and numerous iterations. The definition of scenarios and in-field testing provide useful information to support on-going dynamic strategic analysis on the evolution of the Business Models developed, and to identify the trade-offs required without ever freezing the models.
It's this complete process that is illustrated throughout the chapters of the book.

Fig 2. Business Model design:
how to create and capture value from technological innovation



DESIGNING BUSINESS MODELS FROM ENTRY INTO INCUBATION

Do business creators care about Business Models?
The experience of the **GRAIN** incubator

Bérangère Deschamps (Grenoble University Graduate Business Institute)
Jean-Paul Laurencin (Former GR.A.IN and Grenoble University)

This chapter covers the use of Business Models from the entry phase into business incubation. It's based on the experience of the GR.A.IN. incubator in Grenoble, France, an incubator specialised in high technology spin-offs from public research. How can business creators be guided into exploring this area from the creation of their projects and over the incubation period? Work from the outset on the future companies Business Model carries high stakes for both the business creator and the accompanying structure as the Business Model itself gives meaning to the project and provides several strategic options to valorise the technology. As Business Models are dynamic they evolve with the maturity of the project and orientation of the business creator. The notion of value in Business Models goes well over the idea of value that results directly from the technology itself by introducing a market orientated viewpoint. Finally, the Business Model brings together the elements required to prepare the drafting of the Business Plan.

Introduction

"*Pain is inevitable, suffering is optional*". Doesn't this sentence, from an essay on long distance running (Murakami, 2009) describe the reality of business creators at the beginning of their projects? Though they're surrounded by stakeholders, they're alone in making decisions. Numerous tools exist to help them and some, like the Business Plan, are necessary for any discussion with potential financial investors. To draft the Business Plan, the business creator has to prove the viability of the business idea in detail, mainly through financial forecasts (Léger-Jarniou and Kalousis, 2010). However, at the idea-phase of the project does the business creator have all the information needed to draft the document?

This chapter deals with the initial phases of business creation and notably where the businesses created are spin-offs of public research in technology. In France, research scientists who want to create businesses based on inventions produced by their research activities can be assisted by business incubators (see box 1). These business incubators accompany business creators by advising them through all phases of business creation.

In order to benefit from the services of these publicly financed incubators, those with business projects have to apply for assistance and describe their project by filling in a standard document with a number of sections including: the description of the idea, the target market, the competitive position and turnover forecasts. These sections are those typically found in business plans. Only applications with perceived high business potential are selected to be assisted by the incubator.

At the application stage, the project generally isn't sufficiently mature to enable the business creator to provide the detailed information requested. We feel, to help, that at this early stage, it would be useful to work on the Business Model, even briefly, in order to help take the project forward and to help define the value proposition of the offer resulting from the innovation as well as identify the partnerships that could be set-up. As suggested by Verstraete and Jouison Lafitte (2009, p. 46): « *The Business Model is the centre of the* [entrepreneurial] *process as it's difficult to develop without having previously explored the market, which is not limited to client potential, but includes the whole offer system.*"

How can we get business creators to think through their Business Model at the moment they apply for incubation? In other terms, going back to the words of Murakami (2009), wouldn't thinking through the Business Model at this stage be a way of avoiding future suffering for a business creator from the public research sector? This work on the Business Model, carried out at this early stage, has high stakes for the business creators and for the accompanying structure (the incubator in this case).

This chapter is structured in two parts. Firstly, we describe the analysis carried out on 60 applications for incubation to an incubator in Grenoble (France) GR.A.IN. This was done to identify how the business creators tackled, often implicitly, questions related to Business Models.
Next we defined a number of proposals on the use of Business Models to structure the strategic analysis of the business creation projects from the incubation stage and so improve their success rates.

Context – the role of the incubator

In France, the law of the 12th of July 1999, known as "the law on innovation and research", is at the origin of the creation of incubators (there are around thirty in France). This law has made close cooperation between personnel and research teams form public institutes and private companies. Our research covers the applications phase for entry into the Grenoble incubator in France (GRAIN).

GR.A.IN – the Grenoble incubator

GR.A.IN (GRenoble Alps INnovation) is a structure whose vocation is to detect and house business creation projects with an innovative nature. These projects either come from public research i.e. the technology developed in the project comes from a public laboratory, or are related to public research i.e. the project of an independent entrepreneur needs technology developed by a public laboratory. GR.A.IN helps set up relations between the involved parties. The incubator helps implant new high potential companies in the regional economy and has an important role in transferring technologies developed in public laboratories to new companies. The latter transform these technologies into competitive advantage.
Grenoble's incubator is a community structure which brings together a number of regional universities as well as the many public research laboratories around Grenoble (CNRS, CEA, INRIA). Between 2001 and the middle of 2009 the incubator housed 131 projects resulting in 73 business creations. The number of projects managed yearly, after the initial ramp up, ranges between 17 and 20.

Advantages of incubation

This phase, which lasts a maximum of 18 months, allows those with business projects to bring their projects to maturation and to take on their role of future company manager. GR.A.IN accompanies the project team in choosing the most adapted strategies for their future company: identify the start-up's context (notably the product / market relationship), set-up the start-up (based on the team and the development strategy), negotiate with the future partners of the start-up (research laboratories, legal and fiscal advisors, accountants, bankers and capital investors as well as clients for the prototypes).

Source: www.grain-incubation.com

1 – What role does a Business Model play in business definition at the selection phase of a business creation project?

An analysis of applications for incubation shows that all the elements of a Business Model are part of the project application file, but only implicitly.

BASIS USED FOR THE RESEARCH IN THIS CHAPTER

Research was carried out on 60 applications for incubation. They covered the incubators four main sectors of activity: life sciences, social and human sciences (SHS), engineering and NTICs. Our sample was made up 10% of SHS projects, the other categories each representing 30% of all applications.

The business creators concerned were either research scientists (20%), post-doctoral students (33%), or more frequently someone from outside the public research sector with professional experience and who sets up a partnership with a laboratory.

1–1 Application for entry to the GR.A.IN incubator

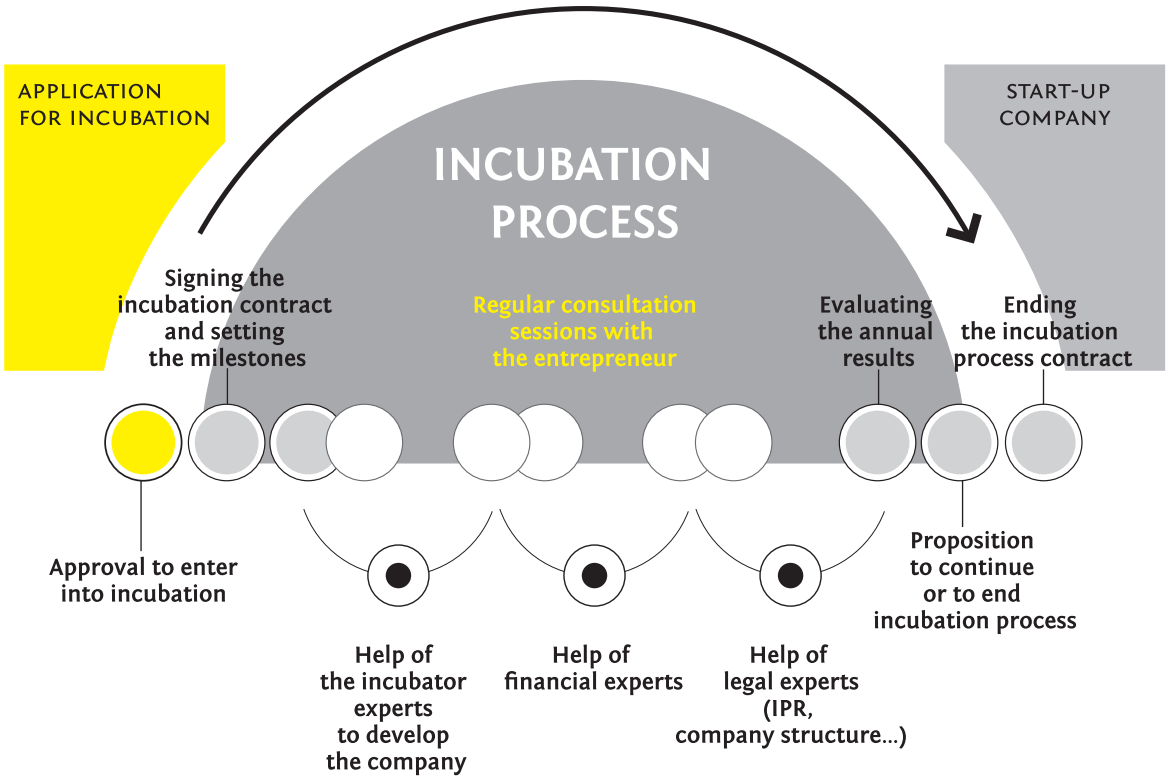


Fig. 1 Application for incubation and the incubation process

Incubation selection criteria

Each application is checked against the incubation entry requirements, and each retained project has to satisfy the following:

- integrate a proven technology coming from a public research laboratory
- propose innovative products or services
- prove its economic viability
- be ambitious with respect to its growth potential

Contents of the application

The application file, whose aim is to present the project to the Incubator's Engagement Committee, is generally the first structured communication around the project. The Committee judges the quality and relevance of the project. The presentation itself implicitly includes information related to the Business Model along with the candidates' responses to the Committee's questions.

Contents of the Incubation Application File

1. General information:
project name (name of the future company), name of the structure to which the project owner(s) belong(s), name and address of the associated laboratory (the partnership between the company and a public laboratory being a condition for entry into this incubator).
2. Summary of the project
(A description of 20 lines)
3. Description of the project:
including its origins, the foreseen product or service, the prototype's state of advancement, description of the level of innovation involved, situation concerning intellectual and industrial property rights, rights of use, technical support to be provided initially by the partnering laboratory.
4. Potential markets:
including information on the clients to be targeted, competition, competitive position, competitive advantages of the project, confirmation of business hypotheses.
5. Technical incubation requirements:
nature and timing of work to be carried out during incubation, technical and human resource requirements to be provided by the partnering laboratory, budget required to reach prototype stage, information on how the transferred technology is to be valued.
6. Economic incubation requirements:
nature and timing of work on the project's economics to be carried out, training requirements of the project members, nature and type of financing requested from the incubator and other organisations, forecast size of the company at three years.
7. Project team:
curriculum vitae and motivation of those involved, foreseen role(s) of the project owner(s) in the company and in its financial structure.
8. Available external elements:
market (and other) studies, assessments already carried out, organisations' opinions, sponsoring, reasons for wanting to enter the incubator.

Position of the Business Model in the application procedure
The project owner has a first interview which covers areas that are part of Business Models. However, this is not clearly explained. Notably, point four above covers markets to be targeted. For this part of the application, the business creator has to cover the value proposition for targeted clients (describe how it's differentiated from the competition). In some cases, when markets don't yet exist, the technology being too new, where the needs have to be created, this approach is totally inappropriate.

1–2 The implicit Business Model behind incubation applications

The business creators, and project owners, with scientific research backgrounds provide very little thought to Business Model related issues in their analysis of the project; they tend to reason according to what they know i.e. technology. The (client) value is supposed to result from the technological innovation. This means that the applicants received tend to insist on three things: technological innovation, the resulting competitive advantage and the positive context.

[?] What is expressed in the applications for incubation?

1 – Value creation is generally supposed to be a direct result of technological innovation
Technology and the unique characteristics of their offer are the main points highlighted by applicants. These characteristics are at the origin of the project and are highlighted through a form of "technology push". The project managers tend to think that the quality of technical development is the most important part of their project, and see it as a guaranty for success. (Ex a biotechnology project based on a new molecule or software development in control command systems based on scientific discoveries, are both deemed to be high potential business creation projects). The question of the value provided by the offer is therefore only posed

indirectly, as it's perceived to be the value of the research produced by the public laboratories that determines the economic value of the new product, service or process. This presumption is in part based on the interest shown by the industrial companies, partners of the laboratory in the early phases of research. Therefore, for most of the incubator candidates the value proposition is a derivative of progress in research. Based on this, candidates express value in three ways: as a direct result of the application of innovative technology, as a result of how the technology is used, or as being derived from the growth potential (and therefore the jobs) related to the technology.

2 – Value creation is thought to result from a market niche position
In most cases, the project developer anticipates a positive reaction from the market simply due to interest in their newly developed technology. A market segment, more often than not a "niche" market, is optimistically considered a sure target. Competition is usually analysed from the perspective of technical performance, through the patents filed, rather than pricing position, market access conditions or other complementary assets such as distribution channels and image. The result of these short-cuts is that revenues and profits are generally over-estimated. A large number of projects involve business to business activities and most view market access and competition from this perspective. Here applicants argue differently. Some don't treat competitive advantage at all, as the success of their idea is "guaranteed by the activity of the laboratory" and part of an on-going process. Others reason strategically, differentiating themselves from the competition through their technology. Most candidates have very technical backgrounds so the lack of anticipation in treating the sales strategy is therefore understandable, notably at this early stage of their projects.

3 – The project is supposed to be part of a stable environment
Candidates generally consider that their business project is in a favourable environment in which the company has a certain future. The project owner counts on the partnership with the laboratory to develop the business, and gain market share but doesn't anticipate the positioning of the company's offer (product or service) in the value chain. Little strategic thought is spent on evaluating negative reactions from the environment or, on the positive side, such things as cooperation with industrial or institutional partners. However, these constitute real threats, or opportunities, to the project and are critical to its success, i.e. its ability to create, or capture, value.

[!] The idealistic vision of the project owners

These three observations illustrate the typical communication of candidates around their projects during application for incubation. The business creator's vision, at this stage, is that of an idealist. From the outset the feeling is that the technology is sure to interest a market, it will be difficult for a competitor to imitate, and that sufficient value will be generated to ensure the survival, or even the growth of the company. This way of looking at things creates the illusion that the business will be able to position itself anywhere on the value chain, without being subject to constraints in its environment that'll probably appear later on. The project is at this stage insufficiently thought through (with the notable exception of the technical aspects) to enable the business creator to provide adequate responses to these market issues.

[!] An incomplete vision leading to incoherent Business Models

Over and above these thoughts on strategic positioning, we noted that the Business Model is not used as such. It's not explained, nor even cited. It's in this area where considerable improvements can be made in helping business creators prepare their projects, all the more so for business projects based on emerging technology. These business projects are not typical in that they interest investors even before they generate results (this is illustrated in research on biotechnology companies and

their governance). The maturity of the business project at the application stage is far from sufficient to provide a real analysis of the Business Model and will therefore inevitably miss promising opportunities and business risks. Business Modelling tools should be seen as being adaptable and be used to guide thought and analysis (Chanal, 2009) and to help consolidate the project and improve negotiation and communication (Sabonnadière and Blanco, 2005).

2– Why base business creation and resulting companies, around the Business Model?

We define two roles to the Business Model, firstly it's a tool which ensures the coherence of the business creator's analysis and secondly it's an extremely useful communication and negotiating tool between the project and its environment.

2–1 The Business Model as a guide for the project owner

[?] *Why should business creators work on their Business Models?*

When structuring the project, the business creator needs to address a number of points: define the business concept, identify competitors, organise what will become a company with a team, consider legal and financial consolidation, business partnerships... At the idea stage, the business creator can only "suppose" and base the replies on his/her intuition and knowledge. All this is formalised in the Business Plan (document that the future stakeholders will consult). The Business Plan includes the results of investigations, whereas the Business Model can be seen more as being a guide for analysis to be carried out, the conclusions of which will be included in the Business Plan. According to Verstraete and Jouison-Lafitte (2009), the Business Model is a step in the business creation process which ends with the Business Plan. We argue, however, that Business Models play a central role in all decisions related to business creation. From the moment that the question of the Business Model has been posed, generally in relation to communication around the project, then later when looking for external financing, it's presented as a challenge to meet and it's around the evolving Business Model, through repetition, that other questions are brought to light. In other words, the progressive construction of the business project evolves with its Business Model.

[?] Why the Business Model?

1 – The Business Model tells a story and so makes sense to the stakeholders

Magretta (2002) reckons that stories explain how a company functions. At the definition stage of the project, the business creator can imagine the story that will transform his project into a company.

To do this Verstraete and Jouison-Lafitte (2009) proposes a guide to:

| (1) Generate value,
| (2) Pay for the value generated,
| (3) Share the value.

These three principles are developed in the form of questions:

| Generate value:
Who makes the offer proposition (the profile of the business creator)? What's the promise does the concept provide? What value is provided for the client? How will this value be produced? (p. 64).

| Pay for the value created:
What is the source of revenue? What's the estimated volume of revenue? What are the potential profits? (p. 69).
| Share the value:
What is the value network (stake holders and nature of their exchanges) and what are their incentives to exchange (p 75).

It's true some of these questions are included in the "check lists" made available to the business creation candidates, but over and above the content, what is useful is the Business Model logic, the way of thinking, its construction and identifying how the various bricks of the project will fit together.

2 – The Business Model foresees several strategic options to produce value from the technology

To design an innovation based Business Model, Chanal (2009) insists, in addition to the elements described, on including the key resources and processes required to develop the value proposal. In other words, by what means will the business creator be able make what he/she wants to sell available? The Business Model guides each entrepreneur in defining the initial focus of the company better and faster, and helps position in its value network and ecosystem. Not going through this early work on the Business Model results in a considerable number of company failures in the first few months of their existence, due to overestimating the offer, rather than making more targeted choices and defining a core business from part of the offer.

3 – The Business Model evolves and matures over time
it's essential to note that Business Models are not static, but evolve over time. The work on the Business Model evolves over the construction and consolidation of the project, with its backtracking and questioning. It's part of the development process and facilitates evolutionist development, through reformulation, questions and responses. Though, usually only implicit at the start of incubation, the notion of the Business Model is central to what happens over the project's life and even into the first years of the company. The Business Model structures the project, provides direction, visibility and coherence over time, better than any other notion, though it's often not used as such.

2–2 The Business Model as a support during incubation

Literature abounds on the difficulties encountered by business creators setting up their projects, and on the benefits of support over the initial phases. At this early stage, though the business creators are not ready to start-up their company, one of the incubator's roles is to ensure that the projects succeed in their transformation into potentially successful businesses. Also, as incubation aims to assist in the development of new businesses, why not make the Business Model a central part of the incubator's support to the on-going development of each project?

1 –Business Models provide a framework and ensure the coherence of business projects

[!] The support provided by incubators is currently not centred on the Business Model

Currently, over the incubation period, the incubator's project leaders help business creators define and detail the five following areas of their projects:
| The functions and applications of the technology,
| The potential markets and targeted market segments,
| The potential industrial partners,

| The competitive position,
| The most appropriate legal structure.
To do this, they have regular interviews and provide training on recurring themes deemed useful to the business creators in preparing their business projects.

[!] The advantages of the Business Model approach

The Business Model is a guide which helps define value captured, exchanged and proposed by the company being created. The construction of the project and the transformation of the business creator into the new role of company manager could usefully be built around this way of reasoning.

2 –Business Models extend the notion of value from that resulting from technology alone, to a market view
Support provided by incubators should ensure that business creators pose a number of questions, despite their uncertain environment and right from the outset. The central theme of the Business Model is the notion of "value". Work on value construction in an uncertain environment needs to start as early as possible. Monitoring projects during incubation highlights the fact that Business Models are not static, but rather evolve with the maturity of both the project and its owner. The incubation period, as opposed to what Karlsson and Honig (2009) state, is the right time to make mistakes and for trial-and-error approaches around the Business Model (Teece, 2009). The Business Model should allow the project owner to identify a number of different scenarios, and then to study them one by one.

3 –Business Models prepare the way for the Business Plans

The Incubator's project leaders could guide business creators on the basis of what they've defined in their Business Models. This would help ensure the coherence of their Business Plan projections through systematic analysis and discussion around the hypotheses behind each Business Model brick (as discussed in the introduction). For example, a strategic vision whose objective is to gain market share, would require a check that it was consistent with sales competencies, marketing tools, an analysis of partners and foreseen financial resources. To conclude, the Business Model ensures the coherence and relevance of each individual brick of the Business Plan. *"The project owner must first find a business idea then develop, and if possible protect, it. He assesses the capacity of the idea on a market, and so it becomes an opportunity. He then develops its Business Model, and strategic vision, which he formalises, in a business plan."* (Verstraete and Jouison-Lafitte, p 46).

2-3 - At what moment should the Business Model be defined?

[?] When?

If we consider Business Models as providing guidance for business creators, we also need to ask the question of when it's relevant to develop the Business Model. In other words, at what phase of the business creation project, or what level of project maturity, is the Business Model relevant, and above all useful for a business creator? Can a candidate for incubation find the replies to each question behind the Business Model when applying to enter into incubation? It's been shown that projects created through structures that have already spun-off start-ups provide considerably more Business Model information than others. This is due to the fact that the project leaders benefit from the experience of their founding structure, and so are more aware than others of the underlying issues. If it's not possible to include this information in the project description at the time of entry into incubation, it's vital that it immerge as quickly after entry into incubation. The support provided by the incubator should enable the project leader find the right answers. At the end of the 18 months of incubation, the business creators must be familiar with Business Models and the underlying issues, which are vital when attempting

to raise funds. As the Business Model is at the heart of the definition of business strategy, incubation is an ideal time for this. It's critical, especially the uncertain contexts typical of innovation projects, that the value creation model be defined as early on as possible, both from the technological and the marketing perspective. Using the Business Model as a tool (Osterwalder and Pigneur, 2010) incites those involved to structure their approach (and hence their project). It also facilitates the work of the incubator in monitoring the business project and project leader. This monitoring is vital for the project's credibility and the trust of its leader in its potential.

[?] Who?

There's also the question of who should be in the team. Some of the team members will have to be able to look into the questions related to the Business Plan, and therefore before this, define and develop the Business Model. It's frequent to find project leaders, with a technical background, join forces with administrator more financial partner. This brings us to the notion that Sarasvathy (2008) calls "effectuation". He believes that the business creator, or project leader, should first of all know themselves well, and clearly understand their perception (and reactions) to risk, measure their level of self-confidence and what opportunity costs they're willing to pay. These key factors are important in all business creations, and help determine what competencies are missing.

[?] How should the role of incubators evolve?

These incubators have existed for ten years. It's therefore worth looking into how they work to better prepare the future. The application form used to select candidates for incubation is highly segmented. Candidates need to think though their Business Models, but the application forms don't allow them to explicitly use the model. The current application procedure may be sufficient for incubators in selecting candidate projects, but quickly needs to be completed through support centred on the definition and development of a Business Model. Applications for incubation could however be constructed around the Business Model structure. At the time of application this could involve basic drafts of the Business Model to be developed. This would be completed and developed in depth during incubation, with the assistance of incubator staff. The experience of incubators also highlights the factors behind the successes (and failures) of incubator projects. Analysis of the failures often comes from a lack of understanding of the issues involved in Business Models and how to build and formulate them. The transformation of technical innovation projects to businesses, then on into developing companies, requires solid communication around the Business Model along with the (strategic) intentions of the entrepreneur through the company's Business Plan. Often, during growth phases, the communication talents of the entrepreneur, now company director, makes all the difference. This underlines the usefulness of incubator support on issues developed through the Business Model approach and communication of the Business Model itself.

Conclusion

"Which Business Model should I use?" is currently one of the questions most frequently faced by business creators. Despite this, the study of 60 business creation projects in the Grenoble incubator, highlighted the fact that the elements that make up a Business Model weren't really dealt with treated in the phases building up to business creation. A fortiori, in the majority of cases, the candidates for incubation express the value of their project uniquely on the basis of technological innovation, which are reckoned to be a guaranty of market demand. This highlights the need to study how the notion of Business Model (and value) could be introduced as early on in the incubation process as possible

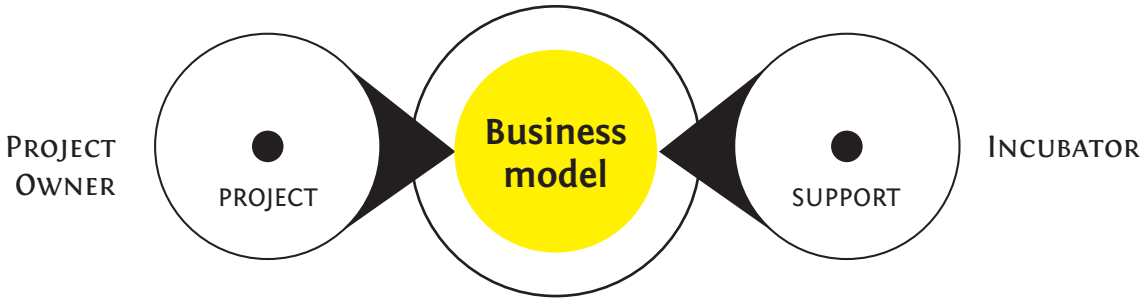
[?] **Why** this analysis of the Business Model? On one hand it provides a guide for the business creator in the definition of all the parameters related to the future business and its activities right from the beginning of the business creation project. On the other hand it provides a useful tool for the incubator to help entrepreneurs prepare the creation of their businesses, notably in the communication with the project's stakeholders.

[?] **When** should the Business Model analysis start? As soon as the business idea has been identified, business creator can start building their Business Model. The results of the work on the Business Model, which evolves constantly over the project, will end up being formalised in the company Business Plan. The Business Model must evolve with the project and structure relations with business stakeholders and decision makers.

[?] **How** can business creators be helped in the development of their Business Models? A combination of two approaches should be able to reinforce work on Business Models within the incubators; firstly through explicit use of the elements of Business Models in the application for incubation and secondly organisation of support by the incubator and financial backers (OSEO, Business Angels, capital risk) in building and testing the Business Models.

The Business Model is becoming a central element in optimising the way business creators and their projects on one hand, and the incubator and support provided on the other, work together to improve chances of business success (Fig. 2).

Fig. 2: The position of the Business Model during incubation, between project and incubator



A more detailed analysis of the business creation projects would allow us to provide further ideas for improvement. One area to explore might be to go through the project details to see if there are Business Model types that correspond to activity types. This would enable these types to be used to further assist business creators in their project making Murakami's words less true!

EXPLORING VALUE-IN-USE TO IDENTIFY UNIMAGINED MARKETS

Axane-Air Liquide and the use of hydrogen powered fuel-cells in the film industry

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This chapter uses the results of research carried out since 2003 in Axane, a subsidiary of the Air Liquide Group (Rosier, 2007; Garel and Rosier, 2007). The mission of Axane is to identify, develop and market viable applications using « fuel cell » technology (applications known internally as PACs). The choice was made by Axane not to target the car market with its uncertainties[1], but rather others to be determined, both niche markets and volume ones. In other words we have an example of a high technology company, whose vocation is to imagine and develop concrete applications, with no existing markets or needs and no industrial capacity.

1 The "traditional markets" of fuel-cell technology are "eternally emerging" (Fréry, 2000) or unprofitable.

The fuel cell, definitions and stakes

Fuel cell applications produce electricity and heat, mainly from hydrogen obtained from the atmosphere. The technology involved has been known since 1839. NASA used it in the first Apollo missions. However, the highest potential applications are still to come. The potential uses for the technology, both fixed or mobile, are numerous, as are the applications being developed: cars, marine propulsion, residential heating systems, etc. The use of fuel cells in applications provides a number of advantages over competing technologies: energy production with no gas emissions, no noise pollution, vibrations, flexibility of use, high efficiency, etc. However, their considerable size and high cost is a sales barrier. In the medium term though, the tendency is promising due largely to the high stakes around the development of fuel-cell technology (Cohendet, Heraud and Avadikyan, 2003). Rifkin (2002) even describes the arrival of a "hydrogen economy". The current international context with its increasingly severe anti-pollution regulations pushes for the development of energy production based on uses of fossil fuels with limited environmental impact. The media interest for these energies is enormous. In this context both industry and governments invest.

Innovation can be defined as being the process through which an organization creates and defines problems (which have potential market value) and then develops new knowledge and concepts to solve them. Management literature distinguishes between sustaining innovation and re-enforcing existing offers from renewal innovation involving the launch of products or services with new architectures. In both cases, the innovations target existing clients and clients identified as future users, which enables them to be included in the innovation design process. Disruptive innovation, or exploration innovation, on the other hand involves situations where the innovation teams have to imagine applications outside their areas of reference and outside those of the market (more particularly the users aren't identified at this stage) and require that they develop new knowledge, new concepts and values to reach their "objectives". The questions posed initially during the exploration phase are often badly posed, shaky or improbable (as viewed from the known universe). The exploration process is often defined as revealing a hidden

or inaccessible reality to the world. This positivist definition implies that the "reality" exists before the exploration phase and that it's revealed during it. Exploring, for us, means producing knowledge on a badly known subject (a new architecture, a badly posed problem, an original idea…).
James G. March (1991), explorer of deviant ideas in management, defined exploration as being experimenting new and uncertain alternatives in all directions, against the grain of existing practices, perfecting and extending existing competencies, technologies and procedures. Exploration is not a finality in itself, rather the objective is to bring to market new and profitable applications through exploration (Garel and Rosier, 2008). Exploration management implies leaving the beaten track, leaving the traditional methodologies and organizations usually used to manage new technologies.

This chapter treats the notion of value (without no reference whatsoever to methodologies of the same name), or how to determine value during the exploration processes. How can we identify value for something that doesn't exist? How can value be determined before domains, markets and clients exist? We'll base our analysis on the experience of Axane in the film business to show how the company built a process to progressively identify then determine value. The film industry is pretty improbable, out of phase and surprising for a company such as Air Liquide, more used to developing new gas processes in its core business, rather than making deals in Hollywood. Yet, from 2003, engineers from Axane were present at the filming of a number of films and form this identified value potential which resulted in a marketable offer with its business model in 2008. The first part of the chapter goes over the original research carried out by this intrapreneurial subsidiary in order to position the Cinéma project in its broader and more systematic exploration strategy. The second part explains the process of building value, from the early definition of an exploration perimeter to the definition of a business model.

1. Axane's development and the trials and tribulations of fuel-cells in the film industry

Between 1996 and 2001, an Air Liquide department worked, on the site of the Advanced Technology Division at Sassenage near the city of Grenoble in France, as an equipment manufacturer on a number of projects, demonstrators of the use of on-board fuel-cells in series cars. This department's vocation is the design of on-board hydrogen tanks and the regulation of gas distribution towards the fuel cells in the vehicle. These projects were in part financed by the European Union. Over this period Air Liquide didn't develop fuel-cells but bought them in from specialist European suppliers such as the Italian company Nuvera, with whom the French group set-up a joint venture to work on the optimisation of the architecture of low power fuel-cell systems (between 1kW and 5kW). It was in 2001, the birth of the joint-venture Axane. Work with Nuvera on a first project was the opportunity to develop competencies in the physical properties of fuel-cells, but the good relations between the teams didn't last and at the beginning of 2002, they separated. Following discussions between the local team and Air Liquide headquarters, the divorce with the Nuvera teams was officialised. Axane continued the activity, but as a fully owned subsidiary of the French group. The company now had to prove its value to the group and to show that it was capable of successfully developing complete fuel-cell systems. Between 2002 and 2003 two projects were carried out that gave the subsidiary its legitimacy and deeply changed its vocation, moving it from the development of technical systems to the exploration of new areas of value.

1.1.: The first technology demonstrator and definition of the exploration strategy: the Polarpac project (January to April 2002)

In December 2001, the French doctor and explorer Jean-Louis Etienne contacted Axane and presented his North pole project "Mission Ice-Flow" to the team. He needed fuel-cells to power his measuring equipment as a complement to his solar panels. Part of the Axane team, between eight and ten people, worked on the

project and over the next three months developed two batteries of 300 W[2] each, fuelled with hydrogen: the Polarpac™. One of them worked in J.L. Etienne's capsule at temperatures of around –40°C. Axane benefitted from the considerable media coverage around the project. The subsidiary demonstrated through Polarpac its ability to appropriate Nuvera's battery know-how in order to optimise the overall system. The project's budget, excluding manpower, amounted to 300 000 Euros.

Following this project, Axane had numerous requests for assistance from car manufacturers but also from various sectors including local authorities and the building trade. What future should be given to Polarpac? In 2002, not wanting to limit themselves into the car industry in the short term, Axane's general manager (COO) presented a business plan to Air Liquide. The business plan described development of the company based on the exploration of niche markets. In the document, the car market is described as being "…a long way from Air Liquide's industrial logic.", and "…not accessible with our current resources". In addition, high power applications (over 100kW) are judged inaccessible for Axane's technology. Finally, the market for application under 300kW "…doesn't appear coherent with Air Liquide's industrial logic as it would result in low hydrogen sales and as its targets are the general public." The Air Liquide group at this stage is unsure of what strategy to follow for its new subsidiary. Over the last century the tradition has been only to create subsidiaries where markets already exist (Jemain, 2002). On the other hand, the Axane adventure is risky as no identified markets exist in the world for the fuel-cells and industrial companies appear to have superior technologies to Axane's i.e. those of the world leader, the Canadian Ballard. Why therefore invest in an entity starting up with this level of handicap? Despite this, Axane's general manager manages to convince the group that the subsidiary will be a source of valuable information on the area of fuel-cell applications which would compensate for the lack of useful market data available on trends or other market data necessary for investment decisions. In addition, Axane's CEO considers that the Air Liquide group would lose out if and when the market for fuel-cell applications takes-off as a sole supplier of gas molecules: the manufacturers will always manage to find gas producers willing to sell their cubic metres of gas cheaper… Axane's work could result in the definition of new standards, new services, and new levels of gas quality or ways of connecting the fuel-cells to the stored gas which would create a more captive market due to an integrated equipment / gas offer. In the end Axane persuaded the group to invest in exploration, whilst basing their arguments on… exploitation. Axane will therefore be the group's spearhead both carrying out market and technology research in an emerging domain and developing new offers (Rosier, 2007).

2 300W corresponds to the power required to supply four 75W bulbs

1.2. Kick-off of the exploration process to find new uses and new architectures: the Rollerpac project (July 2002 to April 2003)

In 2002 Axane had the necessary resources to develop a medium powered demonstrator (2kW) in order to explore the first markets identified. This power corresponds roughly to the electric power required by an average home and corresponds to the power of a small generator. The change in scale (a battery seven times more powerful than the previous one) is a considerable technical and managerial challenge and important for the credibility of Axane in the group. The project deadline corresponded with the 2003 Hanover exhibition where the most recent advances in fuel-cell applications have been presented since 2002.
Within Axane, the Rollerpac project signalled the beginning of project management with a true strategic dimension. For the duration of the project (9 months) the project manager relied totally on the technical director who was the real system architect. The project was carried out on time and was a success both from the perspective of Air Liquide and from the fuel-cell application community. For the first time, Axane presented, not just a technical object, but an application, a portable current generator working at 230V. The project was carried out by a team of twenty people and cost a budget of 2 M€. It also resulted in the development of a modular concept of power supplied and removable gas storage.

This project marked the beginning of the exploration process based on a robust, practically plug-and-play, demonstrator, of which six were built. Axane entered into contact with a number of professional sectors and explored new functions for its products, whilst discovering at the same time that competing energies, even in nich markets, were resisting (Millier, 2003).
Between mid-2003 and 2007, the Axane teams went from being demonstrators to industrialising and producing their products in small series. In 2006, Axane made around thirty products for applications as diverse as mobile energy supplies, stationary energy supplies for isolated sites, or the propulsion of small vehicles. Progressively, Axane's activity moved from "technology watch" to repetitive and structured exploration. Through exploration, Axane identified new applications and made markets, that didn't exist previously, to emerge. Mobile energy sources opened new potential for value creation defined by a number of innovative concepts: "first-aid while listening", "intervene in confined spaces hitherto impossible to access", "provide light in situations where it would otherwise be costly or even impossible" etc. In light cars, exploration into golf carts, utility vehicles and forklifts lead to the concept of transverse energy, "plug and drive". This opened up new perspectives for mobility, notably allowing instantaneous recharging of vehicles and overcoming the need for fuel stations for hydrogen. In the fixed fuel-cell applications, the first target, which the telecommunications sector and first-aid sector, opened up more concepts like "energy buffers" for complex electrical architectures, involving variable energy mixes.
At the end of 2006, Axane is the first European manufacturer to have launched a fuel-cell generator in the form of a generator for the film industry.

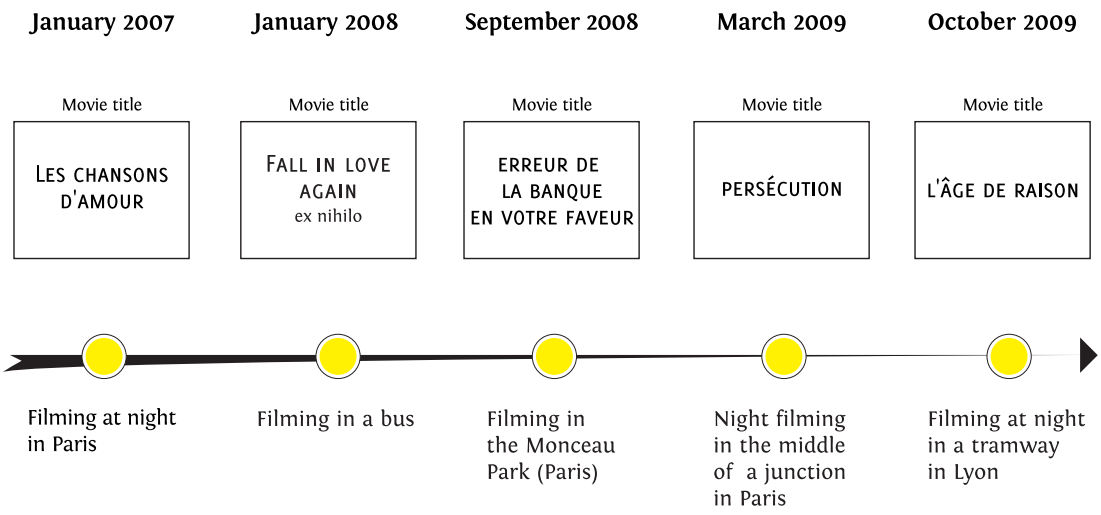
1.3. Axane and the film industry

Axane set up a team to identify the uses and draft product specifications. This team was made up of a project manager, marketers, designers, a fuel-cell expert, communication and sales. It was run on platform mode, had its own budget, created its own methods of exploration, its own way of working with other services and was permanently focussed on finding value-providing applications for future clients. Two key approaches enabled the team to identify and select "film shooting" as a relevant "exploration field" (on this notion cf. infra):
(1) A methodology used to detect exploration areas based on the intrinsic characteristics of technologies i.e. silence and,zero carbon emissions.
(2) An immersion approach using field testing which allows the environment to be decoded and reveals new values by transforming conditions. It's during these field trials that the first characteristics were extended to other design criteria: the need for mobility (to follow the camera for example), service continuity (no system stoppages during hydrogen recharging) or silence of the power supply. From these design criteria the team was able to formalise the essential elements of the product specification and was able to continue exploring and interacting with teams as they were filming and with the movie business in general through fairs and meetings.
In 2007, Axane participated in the first shoot in the heart of Paris at night for the film "les chansons d'amour" (The songs of Love) by Christophe Honoré. The team used a prototype fuel-cell system to power the lighting of scenes over three nights in the wind and the rain. The Axane team suggested an in situ demonstration with no commercial stakes to the film production team. This key step created a climate of trust, mutual learning and openness which facilitated exchanges on: criteria for comparing the technology with others, on existing business models in this environment (services provided, equipment rental) and the price levels in comparison with the film budgets and finally on the market size by geographical zone. Axane noted during these exchanges that their technology was compared to using lorry type batteries: a voltage converter, with exchange of batteries every 20 minutes or so by a technician and a recharge using a small generator hidden in a distant alley... because of the noise, and surveyed by a member of the team to avoid theft.
In 2008, the first product was industrialised. From this point the demonstration offers can be transformed into a full fixed-rate daily service offer including a techni-

cian where the presence of the technician covers the concerns of reliability and safety around the use of hydrogen (sometimes during shooting, in for example buses, tramways and metros, shooting conditions require an expert during setting up). Around that time Axane shot a demonstration video with the professionals (http://www.youtube.com/watch?v=8cTn54Bzmqk) showing the "useful effects" (a notion which will be defined later on). Axane then wins the first contracts in the area and concentrates on developing the business in coherence with Axane's resources and the market price.

On this basis, Axane goes in search of a first contract with both enough volume to justify mobilizing a few fuel-cell solutions and with geographical area reasonable enough to remain economically viable. It was important to find an area with enough clients to provide a high enough number of days rental without having to travel too far and hence optimise both transport time and the effectiveness of the technical support on both the hydrogen and the fuel-cells. A platform at Los Angeles quickly obtained the approval of the team. All the European capitals lacked the density of clients but Los Angeles, on the other hand, had the equivalent of ten European capitals within a radius of 50km! Axane first checked on site and through trade fairs and visits to film studios (Warner and Universel) that there was indeed an interest in the offer and that the market prices were conform to expectations. Next, the company identified the differences between Paris and Los Angeles from a technical perspective and as far as setting up a local activity was concerned (legal, insurance, trade unions, intellectual property rights). This work was facilitated by Airstar, an SME from the Grenoble area and already present in the United States, to whom a partnership was proposed to help access the film industry market. By participating in specialised trade shows, carrying out demonstrations to the studios by using local subsidiaries of the group, Axane and the new partner accumulated and tested their knowledge on the area under exploration which became clearer and clearer. In fine, a business plan was drafted which defined the hypotheses for the distribution of economic value over the following five years. The first use of Axane's solutions started in Los Angeles in the spring of 2010. The market is starting up and still appears promising.

FILMING CARRIED OUT USING AXANE FUEL CELLS



2 – THE CREATION AND MANAGEMENT OF VALUE: FROM EXPLORATION TO A BUSINESS MODEL

During exploration, the value isn't given but has to be built. There is no market to query to measure the value of what we are about to offer in advance. The value building process isn't linear though it goes through three distinct periods, or states: the definition of the field to be explored, definition of the useful effects and definition of the business model and the economic value.

2.1. Defining the exploration field

Exploration is deployed in a given area, defined a priori, but which doesn't constrain the action. The managerial challenge over the exploration phase is to build on the advantages and virtues of the technology to orientate exploration towards applications with perceived value. From this point of view the hydrogen powered fuel-cell systems involve high potential technology (Garel and Rosier, 2007). The hydrogen powered fuel-cells have a number of inherent advantages related to clean energy production. These virtues are defined as concepts in the "fields being explored" (at this stage we can't talk about segmentation). An exploration field defines the unknown area in terms of client value (we prefer using the term development beneficiary) and competencies to explore (Le Masson et alii, 2007). It will ultimately generate a set of innovative projects which may target different markets, or use different technical components. Although defined, the field leaves the freedom to explore a large number of diverse possibilities. An exploration field crosses the traditional product line based organization structures (Charue et alii, 2010). The considered innovative solutions utilize knowledge and concepts that exist within the company, often spread across different parts of the organization. The exploration field focuses either on a technology which could impact several of the company's product families, or on a group of components that could be organized differently, or even new values which could result in solutions that wouldn't fit into the existing product line breakdowns.

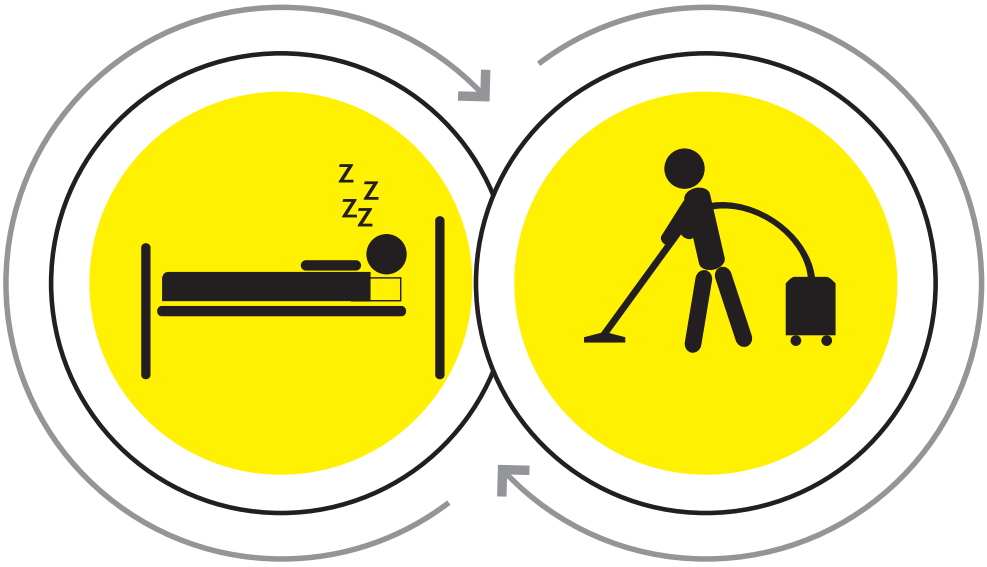
Axane explored the fields defined by the following concepts: "energy event", "emergency ecosystem", "continuous power for telephone relays", "rapidly deployable lighting". The concept "power for shooting films" was identified as an exploratory field at the end of 2002. Axane had to acquire a number of new high level competencies in the techniques of coupling fuel-cell generated electricity to the lighting system of the film set. "The battery adapter has to take peaks of up to three times the nominal current to start the bulb of an HMI lamp" explained a technician. To get over this starting constraint, Axane worked with ballast manufacturers, carried out numerous external tests, modified electronic components and the battery software to develop a new electrical convertor solution. In this way, from the technical point of view, the field progressively became more structured.

2.2. Identify useful effects

In exploration, value isn't part of the technologies attributes but rather is revealed progressively as the innovators bring to light noticeable changes in the activities of the development beneficiaries. The notion of value production through collective interaction is presented notably by the experiential marketing movement (Holbrook and Hirchman, 1982; Carù and Cova, 2006) for whom the consumer buys products or services less for their functional characteristics than for the emotional experience they allow. The experiment designates therefore both the context of use i.e. the buying context, and its finality. It goes over and above the functional use of the product, to become a way for the consumer to access new effects. Literature on services defines precisely value in terms of the consequences for the services beneficiary, in terms of "useful effects". The production of services is useful to consider as it transforms the activity conditions of the beneficiary who, at the same time, evaluates the effects of the transformation (Bancel-Charensol and Jougleux, 1997). In the exploration process, the creation of value is not based on the knowledge of client values (Porter, 1986), but comes through the reformulation of the conditions of the potential beneficiaries activities. In our mind the main stakes of value exploration result from transforming the conditions of the beneficiaries activities with the aim of "producing new useful effects for these beneficiaries" (Gadrey and Zarifian, 2002). We therefore call "useful effects", the effects of the transformations resulting from an innovative offer on the conditions of beneficiary activities.

Imagine the concept of an almost totally silent vacuum cleaner sold at a higher price than the competition (Garel and Rosier, 2008). If we reason in terms of client value and we organise in advance a series of demonstrations with potential users,

we'd obtain at best average results from the evaluation of the perceived direct advantages in comparison with the higher price. This is due to the fact that the users vacuum at moments in the week when noise is less of an issue for them, or those around them. In comparative surveys, users evaluate "iso-activity" by comparing the functionalities of products or services. On the other hand, by considering the useful effects these same users imagine the potential transformations to their activities and go on to consider all the new possibilities this opens. The product can therefore be viewed as a new way of vacuuming during afternoon naps without waking the children for young couples, not disturbing the sleep of elderly persons in an old folks home, to clean an apartment at 11pm during the week to free time for the weekend or to do the housework whilst listening to music or listening to a radio programme.

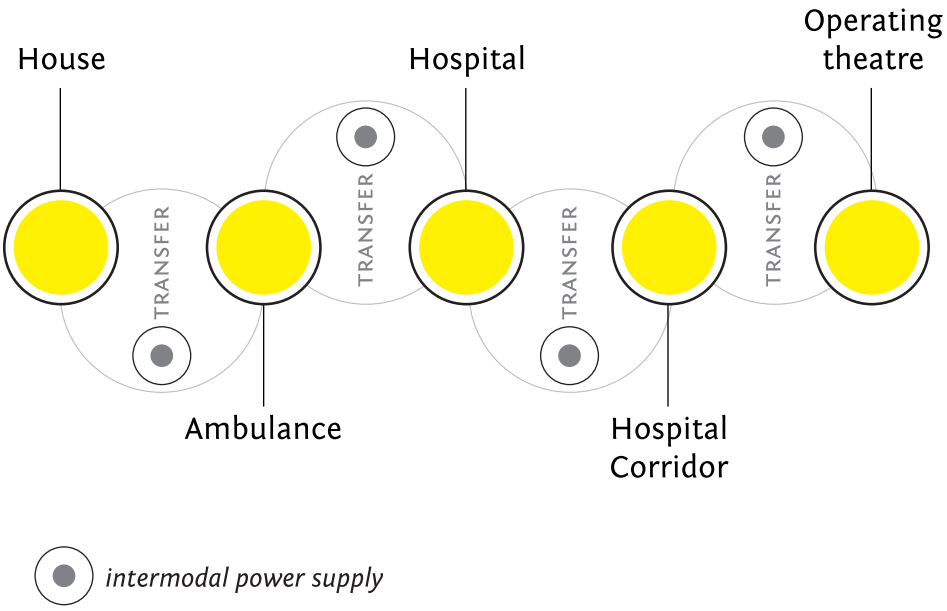


Formulating these useful-effects and obtaining their evaluation by future users means a change in perspective. It's not a question of suggesting new ready-made uses, but rather suggesting the potential to transform their activities. The users of the first of Axane's fuel-cell prototypes are professionals: firemen and construction workers in the building trade for example (Rosier, 2007). Initially they considered the new generator from the perspective of their current activities (as the generators they use have been reliable for ages), judged it to be more fragile and didn't perceive the necessity (no "need" as marketing studies would say) to have it clean, or different. However, as the interviews and tests progressed, two useful effects came out.

1) The hydrogen fuel-cell application would enable them to work in confined spaces without being asphyxiated (tunnels, caves, grottos, confined spaces in buildings), where today long cables have to be used which impede the movement of these professionals. The generator can therefore be considered as being a means of improving mobility and of facilitating interventions in confined spaces, hitherto difficult, or at best uncomfortable.

2) The generator is also considered as being a source of "inter-modal energy", or in other words it's a continuous energy supply that can accompany transport and transfers between modes of transport, for use inside and outside as well as in confined spaces. For example, some equipment, such as incubators and ice-boxes for transporting organs, must have continuous energy supplies whatever the environments they go through. The generator used to supply this critical equipment could therefore be an energy supply dedicated to intermodal transport: transport in ambulances, outside and waiting in hospital corridors.

Fig. 2. An energy supply for intermodal transport



Ultimately, the Axane team has brought to light new action possibilities (through the evaluation of useful effects) where firemen and construction workers had a priori shelved the problems, deemed insoluble by their very nature, using traditionally used technologies. Exploring therefore implies multiple iterations and in situ testing with potential users, notably using prototypes which demonstrate technical know-how and reveal a design (In this case the prototypes of the hydrogen powered fuel-cell applications were made available to the potential users). Using the notion of useful effects brings new values to light over and above the traditionally targeted functions. From a clean electrical power generator we move on to concepts like “power supply for interventions in confined spaces” or “intermodal power supply”.
In the example of film shooting, the exploration phase helped defined two useful effects related to coupling silence and mobility: the battery is mobile and totally silent and therefore becomes an integral part of the “filming system” being forgotten in the background, as opposed to the generators generally used for outside shooting. This discrete power supply is the first useful effect perceived during filming.

A second useful effect is a result of the silent power which allows sound to be recorded live without having to clean the sound-track of the noise pollution due to generators (or having to pull cables hundreds of metres). The silence is also appreciated by the actors whose dressing rooms are powered silently.
In addition to these transformations of conditions of use, the battery is perceived to be an attractive high tech product, a green power supply that the best films should pay to use. We’ll come back to this. This brings us to the definition of economic value and the business model.

From 8pm to 7 in the morning, four Mobixane hydrogen generators with a total power of 10kW, produced the energy required for lighting of the night scenes for the film "Persecution". The main actors in this film, directed by Patrice CHEREAU, were two well-known French actors, Jean-Hughes ANGLADE and Charlotte GAINSBOURG.

The night scene environment of the film, being close to buildings and in the middle of a junction in the Paris 12th district, made both the use of electric cables, which would have had to cross avenues, and the use of noisy generators impossible. In addition, filming was to last from 10 to 12 hours which made the use of batteries impossible due to their lack of autonomy and the impossibility of recharging during shooting. This situation led the production company, Move Movie, to request Axane's services. Axane's hydrogen fuel-cells discretely positioned around the public light posts, to which the lighting for the film set was fixed, considerably simplified making the energy available for the set.

The discreteness of the energy supplies made them "disappear into the background" and they worked perfectly for the duration of shooting. The changing of the hydrogen canisters, around every three hours, was done by a qualified Axane technician during preparation of shooting so had no impact on the filming whatsoever.

The technical team qualified the technology as being "non-intrusive" in their environment. Thanks to its silence, its mobility and the absence of toxic emissions, along with the associated services provided, it enabled them to imagine filming in places hitherto impossible with existing solutions.

"This technology enabled us to work in complete autonomy in the Paris streets, at night in complete silence, without requiring additional manpower and over a long shoot."
Remi Chevrin, President of the French Association of Film Directors.

2.3. Define the business model and the economic value

Once the useful effects have been defined, the potential value they contain needs to be converted into economic value with as finality a viable activity. In other words, this means going from value-of-use to economic value. This is done in three stages.

2.3.1. Determine the environments value referential

The first stage involves using the access to client contacts in situ using the first prototypes in order to evaluate their purchasing approach, in this case, outside the area of power supplies. In other words, finding out about the value referential is in their professional environment.

The question here is "How much are they willing to pay to get a given technology and/or service?" In the cinematographic exploration, Axane brought to light a very broad purchasing scale going from the purchase of services for a few tens of euros daily to rent a battery to 3 000 euros per day for a generator used with a Steady Camer, a system with a mechanical arm designed to keep the camera stable in movement. This value scale provides a reference framework for the sale of the fuel-cell application and associated services.

2.3.2. Determine the hidden cost of existing solutions

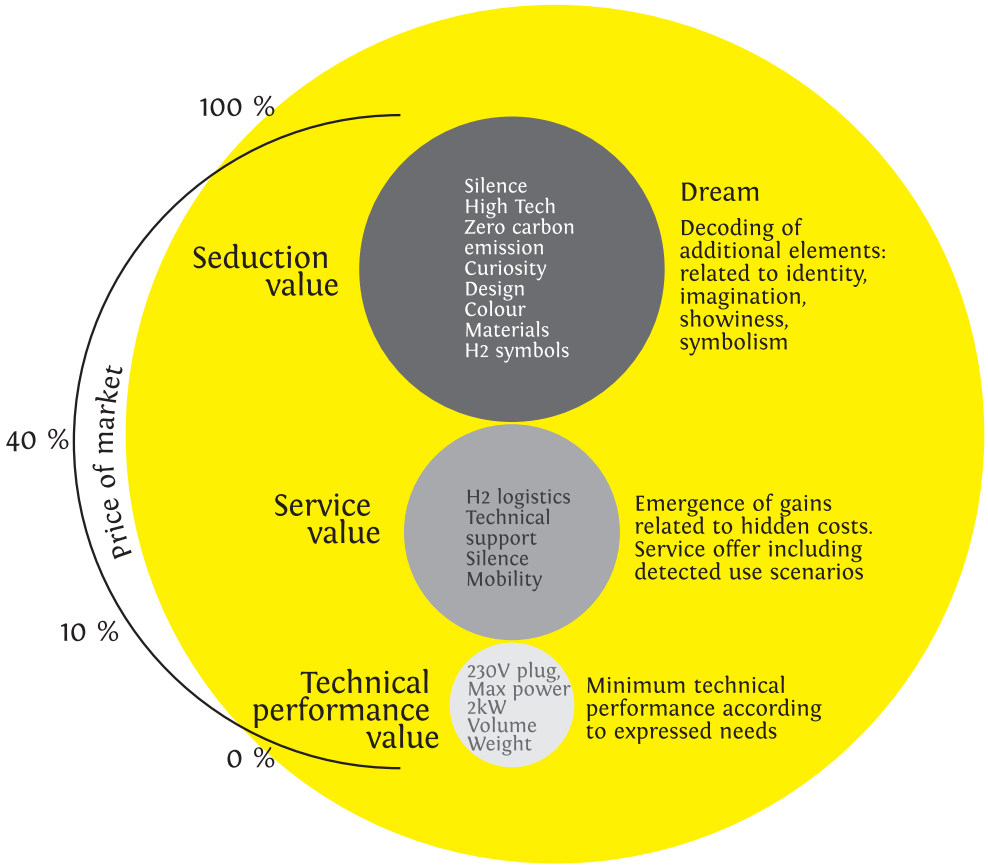
In this second step, the idea is to determine the value by showing the potential "client" the costs compared to those of the existing solutions which means revealing the hidden costs of existing solutions i.e. generator sets or batteries, and from there on the difference compared to the proposed solution. "The production directors tell us that a generator set costs us 90 euros per day, no more". Axane analysed the hidden costs and added them to the 90 euros per day. The hidden costs included the presence of two technicians (one to exchange the batteries every twenty minutes and the other to manage and survey the generator set used to recharge the batteries), the cost of the "rework" of the sound track where the generator couldn't be far from the film set, the rental cost (for example in Paris) of a car parking space to store the generator set when it's installed off set. We can see here, following the example of Edison who'd carried out a detailed analysis of the hidden costs of gas lighting, determining the hidden costs means investing in obtaining a detailed understanding of the existing technical systems and their costs of use.
In addition to determining and revealing the hidden costs, the whole « peace of mind » service proposed has to be priced: setting up the fuel-cell application (hydrogen logistics before and after filming, safety and technical support). To conclude, the company has two types of data: data on the hidden costs of the existing solutions and pricing of the deployment of its offer. We'll present a summary of the pricing of Axane's solution at the end of the chapter.

2.3.3. Determine the seduction value of the technology

The value of the fuel-cell service doesn't only depend on the intrinsic criteria related to the technology used, but also to related imagined and implicit aspects as well as the image. What about the new system makes people dream? When on the film sets the Axane team noticed a desire to be a precursor in the use of an object with a high tech image as well as the capacity of the object to be identified in the users ecosystem (on the film set the battery is black, in non-scratch material, has a soft touch and a tactile screen). In other words to be able to afford the battery" will impress others and highlight the difference between the more and less advanced film sets. Taking this into account, Axane noted that there was a large difference in the marketable price of their service depending upon the type of film. The very high budget films represent the most curious clients and the most anxious to be the first to acquire technical novelties (This category corresponds to around 10% of the targeted market ex. out of 200 films made each year in Paris, around 25 are big-budget films i.e. their budgets are over one million euros). It's a privilege that they want to (and can) pay for. These clients are also capable of more flexibility in the way they work. Also, "In California, it's important on big shoots to show that we use green energy (green power)" explains a technician from the team. This even allows some studios like Fox to use this image as a major differentiator compared to other studios (ex. "Our studio will ensure that your film, or TV series, will be the least carbon emissive on the market"). This was the case with the 24h chrono series where Fox communicated on the first low carbon TV series thanks to the use of "green" filming technology. The dream, or the myth, creates the value! This aspect of value also has to be included in the business model.

Conclusion

The Axane case shows how the business model can't sell a "dream" if there isn't a solid and reliable technical base. The diagram below illustrates the three components of the business model based on the environment's value framework.



To conclude, Axane invoiced a service (from the industrial competency viewpoint, there was definitely a move from selling energy to selling a service) which included the value of the performance based on objective technical criteria, the service value which includes the value of the useful-effects and the gains brought to light through the hidden costs analysis, and finally the seduction value. The latter proved a real price lever in the Axane case, making up 60% of the value. Axane invoices its clients a daily rate for providing a complete discrete energy supply. Obviously, the success of the deployment of Axane's offer doesn't only depend on the relevance of the business model, but also on the initial diffusion strategies ("We need to start with James Cameron or Jacky Chan" commented an Axane engineer).

The focus on the value building approach leaves unturned the key issue of how to successfully manage the exploration phase. The Axane case shows how important it is to be able to carry out varied field observations and tests early on, which requires the ability to successfully manage large, and unlikely, networks within the company as well as the ability to manage teams across "extended enterprises" (cf. the partnership with Airstar). It also shows the need to master a broad spectrum of skills to be able to quickly interface different languages (technical, marketing, uses, economic) and the use of methods and tools to describe the exploration fields (ex. the C-K theory, Triz). Finally, the management of project team dynamics is crucial to the success of the process, in terms of security (protect the team from environmental pressure and short term financial constraints), sense of mission, roles and positions of individuals (integrate competencies, psychological profiles and experience) and the quality of relationships team members. It's at this final phase that the team is at its most efficient in managing and deploying the exploration process. Managing an exploration process and team is a competency in itself.

CHOOSING TARGET SEGMENTS IN MULTIPLE EMERGING MARKETS

Microoled, a start-up exploring the "smart glasses" market

Sylvie BLANCO (Grenoble Ecole de Management)
Caroline GAUTHIER (Grenoble Ecole de Management)
Yukiko FUJIMOTO (Microoled)

This chapter highlights the importance of adopting a marketing approach very early on in the technological innovation process. It is based on the approach used by Microoled for the development of its smart glasses in a highly diffuse market. Three lessons can be learned from this case. Firstly, the segmentation carried out early on by the marketing function allows information on the market to be rationalised as far as potential applications for the technology are concerned. Secondly, the diagnosis approach used enables the most relevant applications to be selected and a more precise market position to be defined based on identified market expectations. Finally, the exploration marketing approach helps set up the R&D calendar to take into account the urgency of developing solutions for the first clients whilst ensuring the mid-term development of the company. We therefore introduce the concept of "early marketing" and underline the key role that it plays in defining the client value proposition.

The customer value proposition is the cornerstone of any Business Model. In the case of the creation of new activities, it is of major importance because it is the first brick in the process of developing a platform of activities. Indeed, little exists prior to it whether we are talking about acquired customers, professions, processes and organizational resources or even the choice of strategic positioning. If we consider the specific case of start-ups based on technological convergence–typical of areas such as ICT and micro and nanotechnology-the actual development of the first offer raises questions and sometimes concerns for marketing. In this chapter we focus our attention on three of them:

- How to choose one or several options from a multitude of potential applications of the technology? Can marketing provide the strategic input that will be necessary to permit the definition of a space for innovation in terms of solution performance and target market segments?
- How can the right balance be found between the urgency of finding the first customers and the necessity to prepare strong mid-term growth? Indeed, in order to grow, technology start-ups need to create a break in a new market while to start, they need to make less risky incremental innovations on niche markets. How can marketing enable reconcile these two requirements?
- Finally, to attain a high level of diffusion of an innovation, how can a position be found that will enable the company to "disturb" incumbents in the future? How can marketing help a start-up colonizing new markets prepare itself against the phenomenon of the "Fast Second" described by Geroski and al. and avoid being eaten-up by these large so called "consolidation" companies? On these major issues, understanding the role and the contribution of the marketing function is essential. These are lessons that we will bring from the Microoled case.

MICROOLED'S SMART GLASSES: A BALANCE OF MARKETING MATURITY AND THE MATURITY OF AN INNOVATION CONCEPT

Microoled is a young company founded in 2007 by two former engineers of the Thomson Corporation with the vision of developing future generations of miniaturized screens. The company specializes in the development and manufacture of solutions based on the OLED technology (see box 1 on applications of miniaturized screens), for which it has an exclusive license to a patent previously acquired by the CEA in France.

We can distinguish the existing markets from emerging ones in this area.

The former include flat panel displays for consumer electronics which are mass markets. The industrials working in these markets are under permanent constraints of price and quality and seek to continuously improve the technical performance of their products based on known consumer criteria: image brightness, contrast, response time, resolution, angle of view, colour, life, energy, size, display surface. In this context, the OLED technology is technically more efficient for flat panel displays than for video at real speed, in colour with a luminosity and level of detail unobtainable by other techniques.

The second concern a number of new markets which first emerged in the early 2000s. They involve integrating the same kind of flat screen, but miniaturized, for applications such as mobile phones and glasses for eye surgeons, in order to make electronic information available in a number of forms. OLED technology allows for the use of flexible substrates such as organic substrates rather than glass, which opens up new fields of applications.

Box 1. The applications of miniaturized screens and OLED

In 2009, the company is in the process of industrializing very high-resolution screens for applications which were to target two established markets: the consumer electronics market to equip cameras and the professional electronics sector to equip medical equipment, the defence and security sectors and communication media. The strength of Microoled's solutions in these markets is their so-called near-the-eye (Figure 1) solutions which are comfortable for the user and make for easy reading as well as providing clear images projected into the field of vision. Tests are underway by companies, clients of Microoled, to validate the performance and quality of the products. In the short term sales development is expected to be very high.

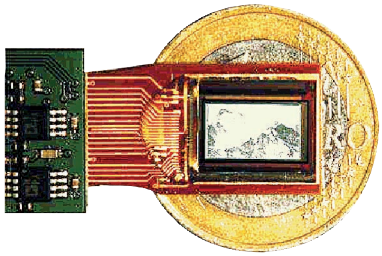


Fig. 1: A minituarised Oled screen, made by Microoled

Despite this situation, the founder and CEO of the company is not satisfied about the idea of development through established markets involving large volumes and intense competition. At best he considers the success of the proposed solutions will tempt a major who will easily be able to take over Microoled. The CEO therefore feels the need to project the company's vision further in time, to the medium-long term, in order to identify how *"Microoled could produce a breakthrough with a new generation of miniaturized screens"*, which could make the company sustainable. This is coherent with what managers of technology based start-ups tend to share: "We must create this breakthrough in the medium term if we are to survive and grow". For the CEO, an offer can be found that will enable the company to differentiate themselves in new markets and which will enable them to grow without competition being able to react fast enough to stop them.

Intuitively, the CEO expresses the vision of a breakthrough in the field of smart glasses for sports. They are based on new generation technology which provides an integrated vision on one eye (an effect resulting from the projection of a translucent image in front of the glasses). A low-resolution screen shows information obtained from the surroundings using wireless technology. The market is not really defined. Numerous potential applications appear at once: information in "connected" towns, mobility, sports or even B to B industrial activities. Microoled, through a number of targeted interviews, notably confirmed the strong interest in France and abroad in the sports arena for this type of technology. The proposed solution is ten times more powerful than the best in the market currently available for cyclists, and on several aspects: screen size (small size and the better visual aspect of the glasses), luminance (through the high pixels density) despite the small screen.

However, the risk level perceived by the CEO remains extremely high: the technical investment is estimated at 1 million euros for an uncertain financial and commercial return. He therefore asks the start-up's marketing manager to identify, amongst all possible applications, both within and outside sports, those that will enable the company to benefit the most from its technological advance. This means finding applications that benefit the most from three characteristics of the Microoled solution: energy consumption four times lower than equivalent devices, a high resolution image on a very small surface due to a high pixel density and its small size. Preference is to be given to mass market offers, due to the initial positioning of the company's first products, though this is not seen as a constraint.

The marketing manager set the objective of identifying, qualifying and prioritizing market segments for smart glasses in two application domains: sports and "communicating-cities". At the outset this involved documentary research which allowed the following observations to be made:

- Numerous attempts to market smart glasses have failed in the past, with the notable exception of a remarkable Japanese company, who became the market leader with solutions primarily for sports applications;
- One of the reasons for these failures lies in the aesthetic problems of the first glasses which are not offset by the perceived usefulness of the information functions;
- As such, the sport is potentially more promising because there is more demand for the informative functions than in urban tourism. The cities currently have considerable difficulty in identifying relevant information;
- Finally, it is likely that the Japanese market be the most relevant segment for the commercial launch of smart glasses because of its high demand for novelties and the fact that it is relatively less sensitive to the aesthetic issues around this type of object.

At this stage the decision was taken to focus the marketing analysis on the sports segment, in coherence with the CEO's intuition. The next step involved identifying market development levers, within a semester, to overcome the obstacles that had caused so many failures in the past. Three types of lever were identified:

1. Understanding the factors that had led to the success of the Japanese company that Microoled could re-use;
2. The identification of the market segments with the highest demand, in other words those which have "critical areas" where Microoled's solutions can provide significant performance gains at conditions that would be acceptable for the clients;
3. The setting up of an ecosystem of actors, specifically involved in the breakthrough innovation led by Microoled, in order to influence the environment and to set-up a complete value chain for the production and distribution of the innovation.

Based on these first findings, three actions were deployed.

The first concerned the organisation of a mission to Japan to learn from the market leader, whilst at the same time, testing a pre-market launch of a solution. This strategic assignment was made easier as the head of marketing is Japanese and easily obtained a rendezvous with the Japanese leader in smart glasses for

sports. This first meeting is viewed as a small victory by the general manager due to a few previous negative experiences. The information obtained during the interview was very useful, even more so as Japan is reputedly the world leader in OLED technology. The market actors, and notably the users, are well aware of the potential functions and the useful information that could be provided by glasses thanks to OLED technology. They spontaneously participate in the definition of the first models and help identify areas for improvement. It is through this collaboration that the importance of the aesthetic issues was highlighted, though it wasn't deemed a blocking factor for the users (On the first glasses to be equipped the electronic devices were quite visible.).

In fact, these Japanese "pioneer users" appear to have opened the way to a mass market extending over and above the Japanese market, which demands high quality products and services, from reactive professionals, sold at attractive prices in an intensely competitive environment. The clients are particularly volatile and don't hesitate in moving from one supplier to another where the price is better even where this means going for a less technically advanced solution. The distribution of the offer appears to be a critical element in determining the success or failure of the innovation along with the necessity of having a differentiated offer as far as technical performance is concerned. More specifically, the performance criteria involve high image quality (contrast, luminosity, colour saturation) and a complete solution with an interface controller.

Another marketing conclusion for Microoled concerned the necessity of being present locally on the Japanese market in order to be able to benefit from the feedback that this unique market can provide in testing innovative concepts in this area. This puts into question the company's roadmap as the intention had been to target Europe initially. Another critical point involved the constraints on technical quality, obligatory for the credibility and image of the company and its products, even if it means reducing the number of informative functions in the smart glasses (in order to limit the risk of dysfunctions). From this point on, the second marketing action was vital in that it would enable Microoled to identify the required technical characteristics of the glasses and the segments that could be targeted.

This second action involved carrying out a qualitative survey of practising sportsmen in a number of very different sports. The retained approach used was the one recommended by P. Millier in his book "The study of markets that don't yet exist" (2006) (*"L'étude des marchés qui n'existent pas encore")*. Documentary study and an analysis of patents in the area enabled the team both to identify the applications and their functionalities and the actors involved in providing real time information to sportsmen and women. From this information they derived a matrix of potential applications, based on the imagination of the Microoled teams. This enabled them to define a list of potential clients in the various sports as well as an interview guide aimed at obtaining more information on their potential needs as well as their constraints and purchasing habits. Sportsmen and women, associations and sports federations were consulted and following around thirty interviews a first market segmentation was drafted by the marketing manager. The segmentation is illustrated in Figure 2.

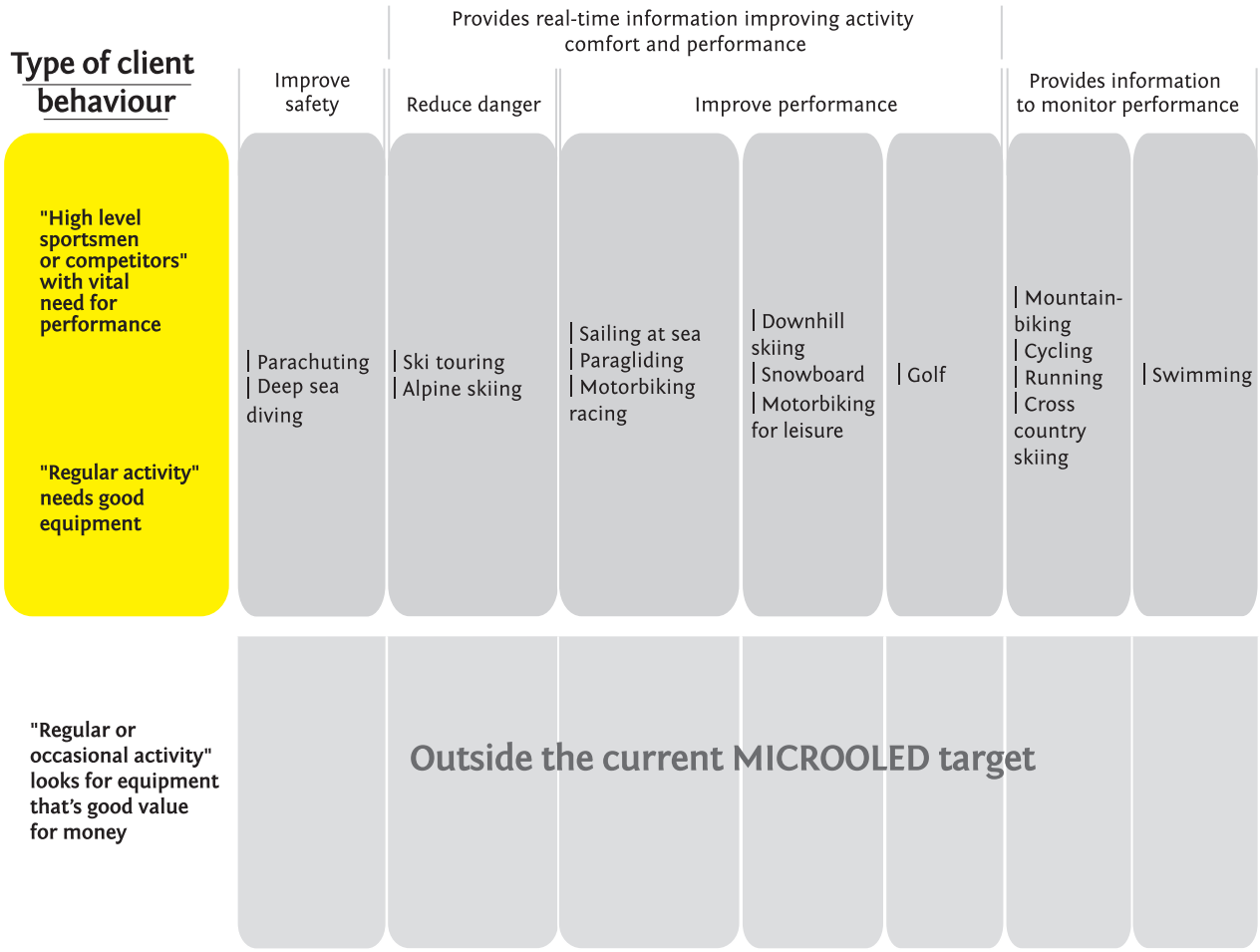


Fig. 2: The market segmentation for intelligent glasses in sports
(SOURCE: MICROOLED)

Each identified segment was analysed to evaluate its attractiveness, the expected benefits, and Microoled's strengths in comparison with competing solutions. The criteria of autonomy and the size of the device systematically emerged, as strong conditions for acceptance, and therefore purchase, for potential buyers. The technical characteristic of low-power appears to be the key to the success of the final solution. The marketing analysis of each segment resulted in positioning Microoled as shown in Figure 3.

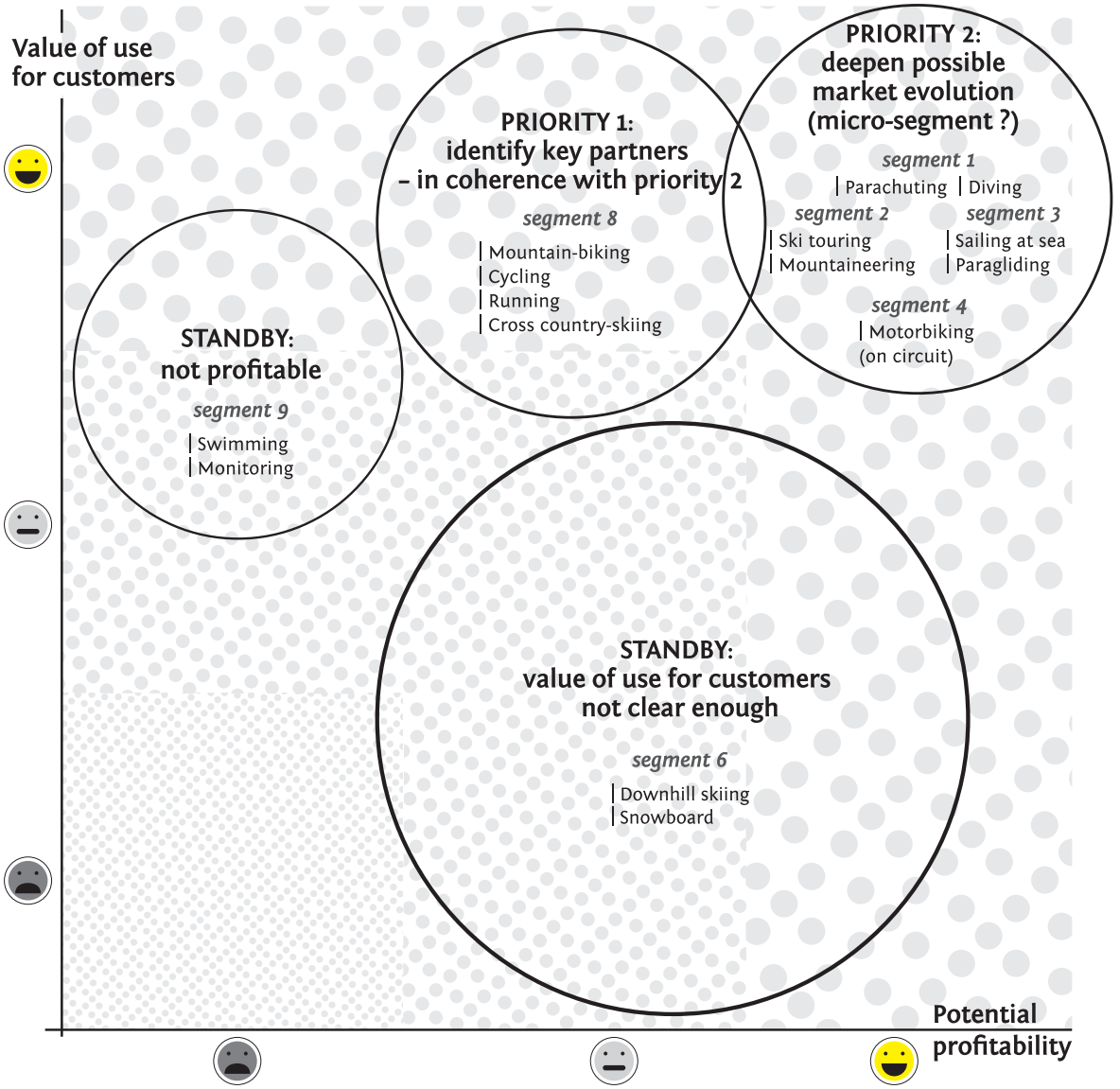


Fig. 1: Position of Microoled market segments

The marketing recommendations pushed two priority segments:

- The "monitoring" segment for endurance sports such as cycling, running and cross-country skiing;
- The "alert information segment for parachuting and deep-sea diving.

Several developed scenarios could therefore be considered. The scenarios will enable management to get actions underway more serenely than if their decisions were based on intuition alone. With the aim of building scenarios and then getting actions underway the marketing department has a third mission that of identifying partners notably for the distribution of the innovation.

The third marketing action involves setting up an ecosystem of relevant complementary actors around Microoled's technical solutions. This phase is crucial but difficult in that the company is still in the early phases of innovation; the market segments are emerging and the company doesn't (yet) have an offer to show, or prototypes, nor market studies or even its first clients to help persuade potential partners. What is therefore required is to set-up exploration partnerships rather than go straight into sales partnerships or resource sharing partnerships. Microoled opts at this stage for partnerships with actors with the same innovative approach favouring a value network approach through patent application. A first potential list of partners was drafted along field of work. The potential partners are then sorted according to

their interest for the company before attempting to get into contact. Their interest was determined along two lines. Firstly the facility of access was evaluated notably going through such things as R&D clusters and trade development structures. Secondly their compatibility was assessed in terms of market development objectives and distinctive resources. In this way the marketing department paved the way for the setting up of innovation partnerships and alliances.

Learning from the Microoled marketing approach

This case adds to the marketing innovation approaches that are already widely known. Here, we propose the term "early marketing". The case highlights the important role played by marketing very early on in the innovation process, notably in contexts involving innovation breakthroughs, a high level of uncertainty and irregular rhythms of innovation. The upstream roles of this "early marketing" emerge from this case essentially on three levels.

Marketing assisting in identifying new paths of innovation

It is generally accepted that innovation marketing occurs well before the development of an innovative concept, at the looking-for-ideas stage. The Microoled case does not present the identification of new ideas as being a matter of priority, nor even an issue. The real question here concerns the definition of the perimeter within which ideas are generated so that they then have a chance of being selected as being part of the strategic logic of the company. This implies a marketing function capable of capturing conflicting signals on trends from unexpected, unusual sources of information, not determined in advance (Bessant and Tidd, 2008). In the Microoled case, the initial material appears to come from an intuitive leader with close ties to a network of visionary entrepreneurs and business leaders recognized for their innovation dynamics.

The implication here is a marketing function changing paradigm; getting out of logics and proof, factual descriptions and rational decisions on markets and their dynamics. Marketing, having changed paradigm, can adopt a support role in making strategic decisions by amplifying intuition and emotions on converging information and indices. In this sense, this means more proactive marketing which is able to extend the roadmap timeframe of the product market beyond 2 to 3 years. To this effect, it would probably be valuable to draw on business intelligence approaches based on weak signals. One of the new challenges of innovation management is that of multiple dynamics requiring ambidextrous organizations as defined by Tushman and O'Reilly (1997)[1]. The marketing function has a vital role to play in the development of this organisational capacity. This mission is not automatic as it strongly questions the acquired knowledge, know-how and practices of marketing teams.

1 Ambidextrous organizations are defined as being organizations with the ability to simultaneously conduct operations and carry out exploration activities. In the case of Microoled, this involves being able to provide resources and expertise to explore new applications involving OLED technology.

A MARKETING FUNCTION WORKING TOWARDS THE EMERGENCE OF NEW MARKET SEGMENTS

The approach adopted by the Microoled team is that developed by P. Millier. It involved creative multi-directional research followed by focusing on two key elements of market segmentation:

- Innovative applications at the crossroads of specific high performance technical functions and the use of these functions in specific contexts that generate critical issues or strong dissatisfaction. This, for example, is the issue of warning functions vital to a skydiver who is systematically and reliably informed, when getting dangerously close to the ground,
- Attitudes and purchasing criteria of customers who seek the positive result of the comparison between the benefits of a given solution compared to another and the constraints related to its purchase and implementation.
This concept is necessarily subjective and entails a direct confrontation between the innovative solution and potential clients.

On the basis of these elements, the marketing analysis enabled the team to qualify and characterise the accessible growth market segments

The Microoled case however raises a number of questions that may complete the approach proposed by P. Millier. Firstly, lessons acquired from past successes and failures appear to be a source of accelerated learning that one cannot acquire from users and potential customers. More than market truths supposed to enable us to reproduce or avoid strategies and markets, these lessons from the past experience of other actors enable us to understand the dynamics of change and the levers for action available to the start-up. Microoled has entered into a "collective intelligence process" with the Japanese society through toing-and-froing between the potential of the proposed technology and the innovation dynamics of the smart glasses market. We are now beginning to understand the co-emergence mechanisms of innovative solutions and new market segments. A high level of uncertainty has to be accepted, even at the end of the segmentation phase, with the quantitative analysis of the size and rate of growth rate of the segments concerned leading to approximate results, and relevant where possible.

In this context, it is interesting to note the lack of attention paid to the usual key data and indicators used for marketing decisions, data related to market tendencies and the behaviour of actors. This last observation brings us to the third function of upstream of marketing in the innovation process, that of the support with strategic innovation opportunities.

Marketing assisting in the strategic selection of opportunities for innovation

The stake today for any company is not to produce two types of selection error:

1. Omission errors. These are errors that involve not taking the plunge, not going down a road (generally a breakthrough) through not having paid enough attention to it, or not giving it enough credit, or
2. Commission errors. These errors involve embarking on a path that which turns out to be a failure and from which no benefits are obtained.

Marketing generally concentrates on avoiding the second type of error, through learning from past experience; this unfortunately tends to push it into committing the first type of error. The Microoled case suggests another way of selecting innovation opportunities for new markets, by tending towards the ambidextrous organization. This means thinking through internal selection, by the actors from within the organization, and external selection, by the innovation ecosystem which builds on the capacity to mobilise actors around the innovation as well as through joint exploration. The marketing function can be a key player in identifying external partners without whom the innovation would not come into being let alone be marketed. This work entails a considerable investment in time and effort where technological breakthroughs are concerned and where numerous competing solutions can address a very wide range of opportunities. It also requires that these breaks do not come at the expense of incremental innovations, allowing short-term exploitation of the activity-as is the case for Microoled in the field of consumer and professional electronics.

One issue remains unresolved, the transfer of the upstream marketing knowledge to a rigorous but flexible operational marketing function. This knowledge transfer concerns:

- Product knowledge:
  The offer is highly changeable in terms of quality, features as well as options, service and guaranty;
- Price knowledge:
  The price level is fairly high for the first segment, then becomes more attractive with promotions (reductions, discounts), payment conditions and credit options adapted to each target segment;

- Distribution:
  Initially market proximity is required though the importance varies according to market segment;
- Communication:
  Communication moves from one-to-one communication with technical arguments based on performance to broader targets and a more commercial sales pitch.

Conclusion

The Microoled case shows the complementarity of traditional models used in managing the innovation process. By using innovation marketing tools, a new more iterative and multi-directional process is proposed (Figure 4).

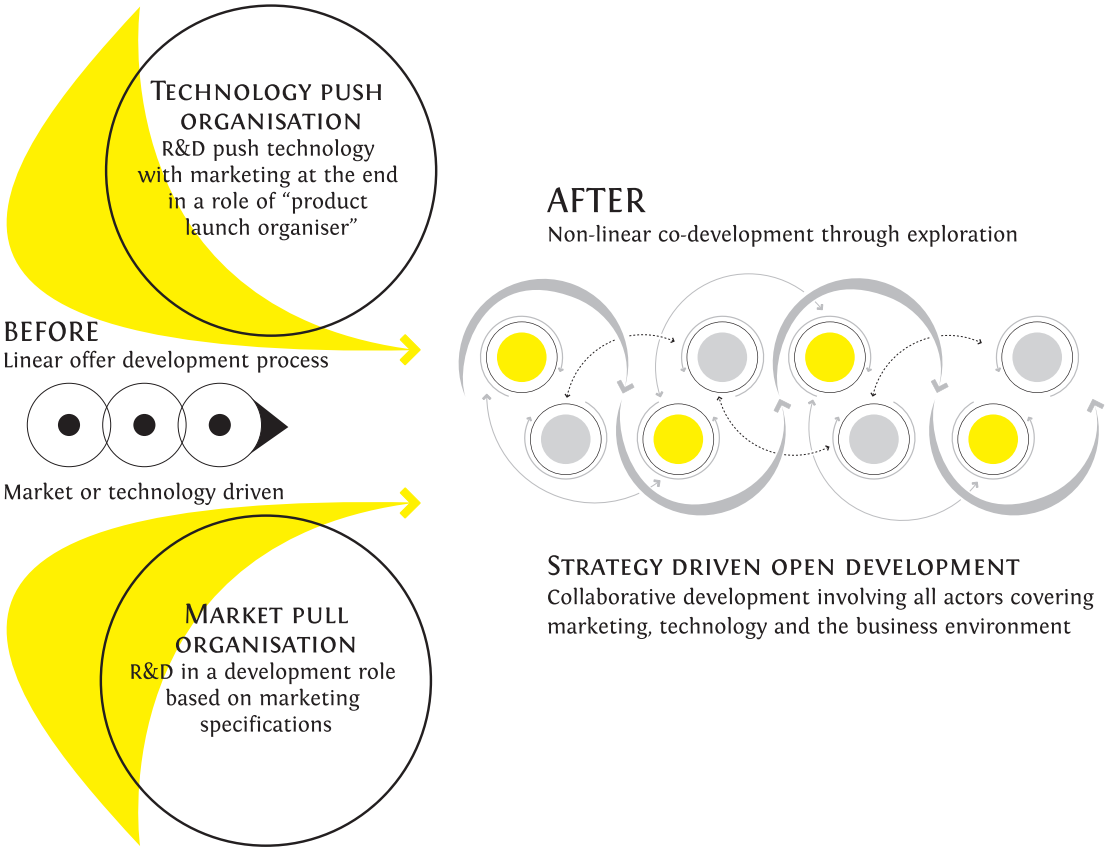


Fig. 4: Innovation management process for the Microoled case

It provides for better and more systematic monitoring of the innovation process and gives it a strong market orientation. The paradigm changes too, moving from a traditional predetermined approach based on static, or stable, factors, to a dynamic process of building and change built on dynamic factors.

What appears obvious today is the need to recognize the important contribution of marketing beyond the operational business process and the traditional operational marketing roles. This is notably important in order to better combine incremental and breakthrough approaches, short-term and long-term orientations in continuous interaction with the innovation strategy of the company. This shows how the issues of organizational ambidexterity according to Tushman and O'Reilly's definition are just as applicable to marketing and other business functions! More particularly Microoled's "early marketing" approach helped make development choices that proved crucial, upstream in the innovation process.

BUILDING A PROFITABLE BUSINESS MODEL WHERE CLIENTS DON'T WANT TO PAY

Sportganizer and the use of sponsoring in a Web 2.0. platform

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Romain Parent (Sportganizer)

This contribution discusses how sponsorship may be superior to advertising as a source of revenue for Web 2.0 platforms. The Sportganizer case illustrates the central issue of the revenue model of these platforms in two-sided markets. Online advertising and online sponsorship are then compared and it is argued that the former is a better source of revenue, mainly through its capacity to generate higher positive crossed network effects.

Introduction

Websites for the general public of the so called "Web 2.0" or "social network" type such as YouTube, Facebook and Flickr are characterized by the fact that users can deposit and edit content and, in doing so, contribute to the value of the service they use (Tapscott and Williams, 2007). Insofar as it's the users who create and develop much of the content, these services have mostly been developed on a free basis. This raises the question of financing and the Business Model of these platforms providing free services.
Web 2.0 sites tend to use the same economic logic as the free press i.e. they are financed essentially through advertising. The fact that they are provided for free and have large audiences of people with common interests brings a large qualified audience for advertisers. In addition IT tools allow Internet users' activities to be traced along with their clicking behaviour and centres of interest. This is one of the main explanations for the considerably higher growth rate of Internet advertising in comparison with advertising through traditional media.

Despite this, use of the Internet advertising as the sole means of financing faces criticism, both from advertisers who question the cost-effectiveness of banners and sponsored links, and users who develop resistance to these messages which are often perceived as being intrusive. Given these limitations, are there any alternative methods other than advertising to finance free, or almost free, web services?

The objective of this chapter is to reply to this question by showing how sponsoring can be an effective alternative to advertising. Sponsoring is a form of association by which an organization makes funds available to an entity involved in a socio-cultural activity in order to reach communication goals (Walliser, 2006). Sponsoring is based on the existence of the entity being financed. For example the combination of the BNP bank and the Roland Garros tennis tournament is possible because the latter exists. Also, representations generated by the event (values, beliefs ...) are what the sponsor aims to capitalize on. On the other hand, the sponsored entity (and its message) especially when it concerns an event, often couldn't exist without the sponsor's support. On this level, there is therefore a real symbiosis, almost in the biological sense, between the sponsor and the entity being financed.

The encounter between the "message" and the audience is also less passive than advertising and the sponsor benefits from the positive image associated with the entity being supported through a transfer phenomenon.

The value of sponsorship in this context will be analysed through the presentation of the Sportganizer platform. Sportganizer's business is to provide tools to facilitate the organization of those participating in sports events i.e. typically helping a trainer prepare a team for a trip to a match or competition. Firstly we'll present the platform and show what a two-sided platform consists of and in what way financing this type of Business Model is a problem. Secondly, the differences between advertising and sponsorship will be shown and we'll explain how Sportganizer uses sponsorship. Finally we'll conclude on how sponsorship appears to be better adapted for this type of platform than advertising and how it could be developed to provide new value proposals.

Sportganizer: a success that needs to be financed in order to develop

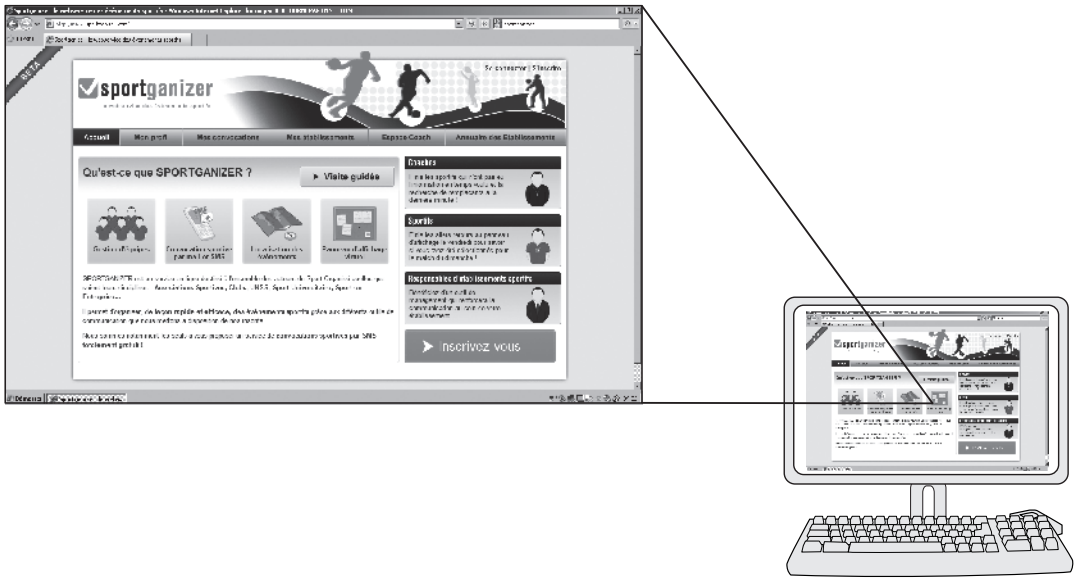
[!] Sportganizer and its original strategic position

The initial project was to develop a site to help organise a community of leisure sportsmen and women outside clubs or associations. Research into competition showed that a considerable number of similar projects existed; they didn't, however, address the communication needs of local associations. The value proposition could therefore involve providing them with an online tool to facilitate their internal communication.

On a national level, in France, amateur sport is highly structured (federations, regional leagues, county level committees down to local associations). Locally, however, sports associations consist of a multitude of social communities where various actors interact informally (sportsmen and women - adults or children, trainers, parents, physical education teachers, referees, heads of associations, etc.). To create links between all these people just to organise a trip for a group of youths to a sports venue, for example, requires rigueur and precision in the information exchanged. Without this, the financial and/or sports consequences can potentially be disastrous (ex. fines, relegation). However, for budgetary reasons, the communication tools used by associations are often rudimentary and in practice often limited to billboards.

From this observation, Sportganizer made a simple value proposition by focusing on the functions most useful for the targeted users. An in depth discussion with stakeholders (a rugby trainer, three PE teachers, the regional head of university

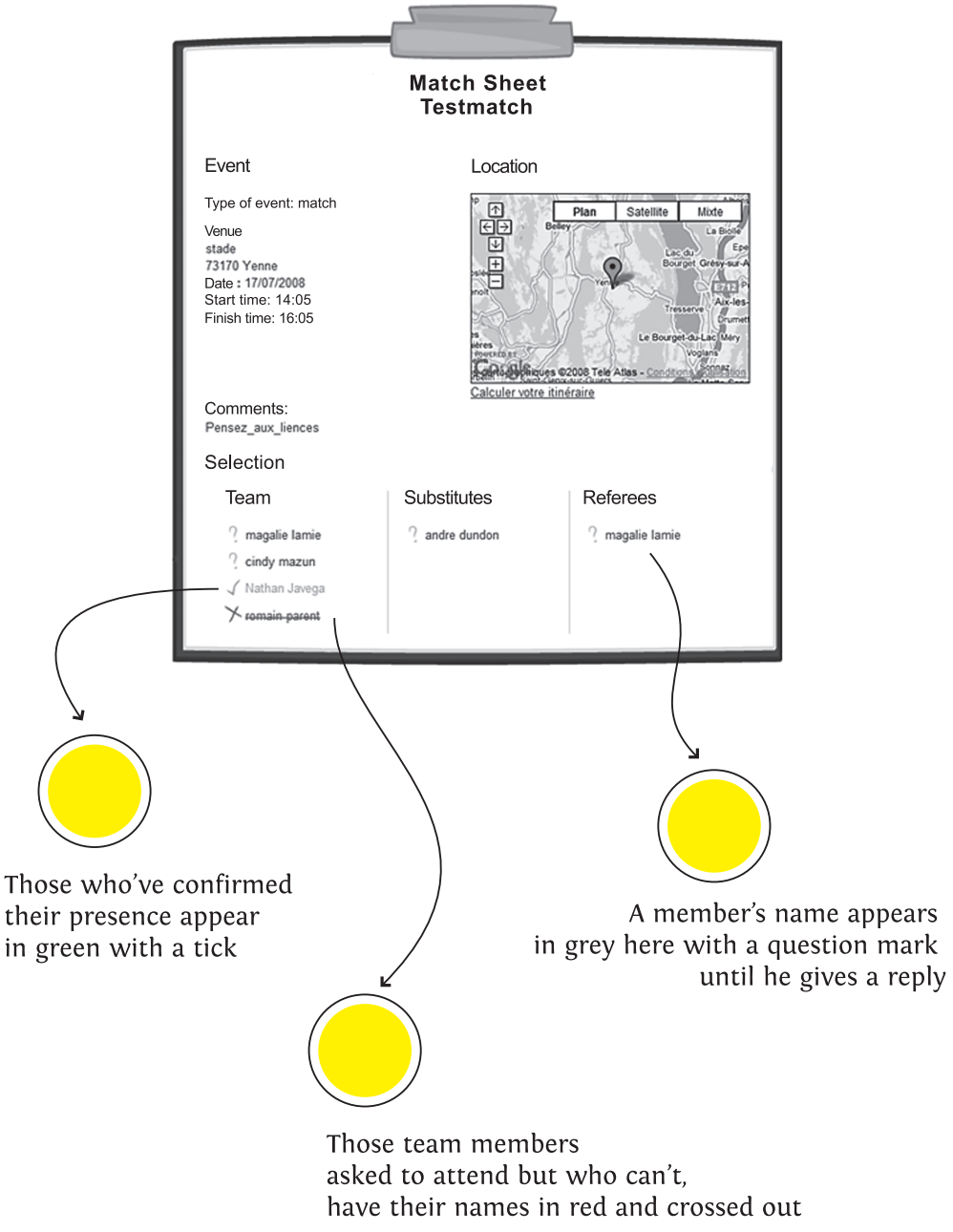
Fig. 1 The Sportganizer site created in September 2008 (www.sportganizer.com)



sports in the Rhône Alpes region as well as fourteen sports fans - six sportsmen and women: four handball players, two rugby players and two badminton players) showed that the process of "organizing sports events" is critical in terms of communication for the clubs. For athletes it's inconvenient to have to go to the club billboard or to their school each week to see if they will be playing. For trainers, it's difficult to know who's accessed the bulletin board and therefore who has received the information. For this reason a number of trainers call each participating player which is extremely time- consuming.
Capitalising on these observations, the first version of sportganizer.com was launched in September 2008 providing, as its central function, the possibility for trainers to organise sports events in just a few clicks.

After having filled in his match sheet in and posted on the site (Fig. 2) a trainer knows that every selected team member will automatically be notified (via SMS and email) and asked to confirm their availability online. In the event of a change in availability the trainer is informed by the same means and can, if necessary, invite other players to avoid a withdrawal of the team.

Fig. 2 Example of a match sheet on Sportganizer



A number of complementary services were progressively added to this central function: calculation of routes for away games, organizing car-pooling, secure virtual bulletin boards for sharing files (models of medical certificates...) and information, etc.

Functionally, Sportganizer.com can therefore be defined as providing a service which enables those with no technical knowledge create a sports association's Intranet. After two seasons, a first analysis showed a real success. Nearly 500 sports clubs have signed up on the platform, more than 2000 sporting events were held and over 25,000 notices were sent to sports in France. A large number of these associations use the platform in a systematic manner to organize their events, usually on a weekly basis. To continue to be able to meet this demand over time, the question of the platform's economic model was raised from the outset.

Sportganizer, a two-sided market platform

The design of Sportganizer's Business Model was based a priori on the fact that services for the clubs would have to be free, due to their lack of financial resources. It was therefore necessary to finance the on-going development of the platform by "third parties". In Sportganizer's case, three types of economic actors are involved. The company managing the platform, mid-way between content supplier and a hosting company (Frochot, 2008), provides the space and the tools to manage the content and in addition connects those who provide the content, those who use it, and finally those who fund the service. The other two categories of actors are the service users (members of local clubs, be they sportsmen, sportswomen or trainers) and those who finance the service. This model can be assimilated with what economists call a two-sided platform (Insert 1). It brings together two sides of a market, the "subsidized" side (in this case the users), and the "payers" (who still have to be identified).

Insert 1. Two (and multiple) sided markets

On following page ›

Two-sided markets put two groups of agents together whose interaction generate benefits. A platform, or an intermediary, facilitates the transactions, or in some cases makes them possible, by reducing their cost.

In these markets, the question of price structure is central. The price is the determining factor as regards the volume of transactions carried out on the platform. An example of this is the situation where the prices applied on one side influence the presence, or not, of economic agents on the other side (Rochet and Tirole, 2006).

The credit card market is a good illustration of this point. The prices and conditions of payment of the platform, i.e. the credit card management infrastructure , are differentiated on either side. The consumers pay an annual subscription, whereas the traders pay a percentage of each transaction.

Two-sided markets are characterized by the presence of four types of external network effects (Shuen, 2008):

The direct effects: the value of an object increases with the number of people using it,

The indirect effects: the increase in the use of a good or service increases the value of another complementary one,

The social network effect: a consumer will be influenced by other consumers in the choice of goods or services,

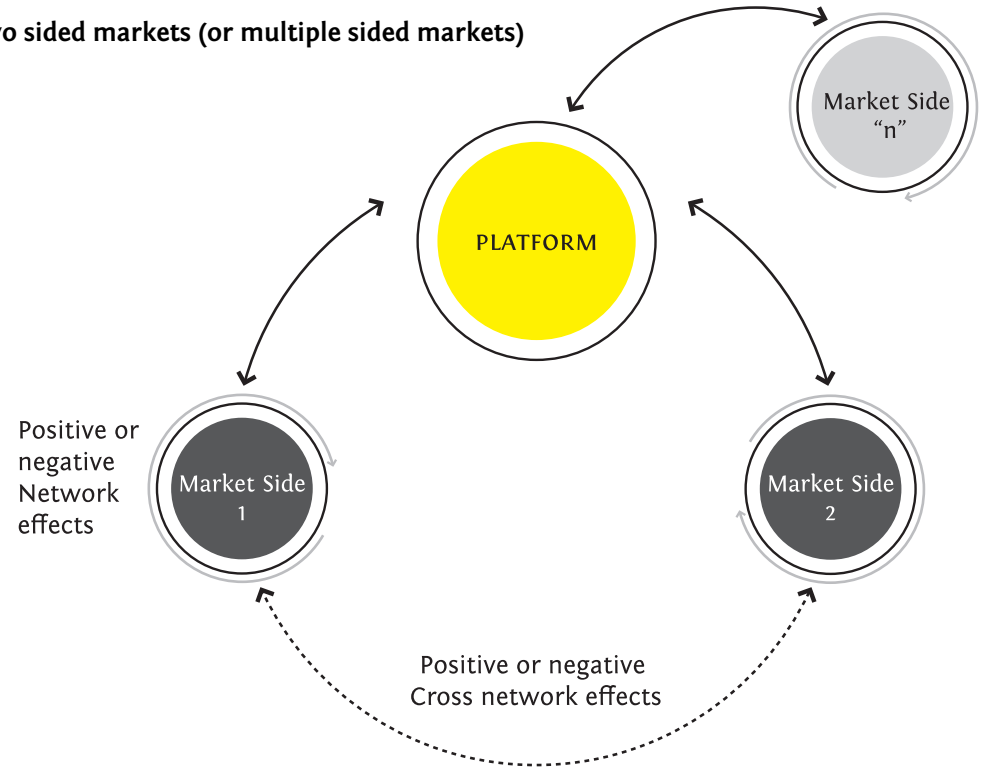
The cross-network effect: the value of a service on one side depends on the number of users on the other.

The above are typical of two-sided platforms. Here the value depends not only on the consumption by the agents of the same service (direct network effect), but also, and above all the consumption of the agents on the other side of the market (Rochet and Tirole, 2006). The value of a credit card for its holder increases with the number of traders that accept it. On the other hand, a trader will be more inclined to accept a given credit card where the number of users is high.

As a consequence of this, the platform manager involved in a two-sided market must develop a revenue model which has a positive effect on the volume of transactions (economic or otherwise) that are carried out on the platform (influencing the presence of individuals from both sides of the market). To do this he needs to encourage the external presence of positive crossed networks and limit the potential negative effects.

The main difficulty, at the time of platform launch, involves getting the two categories of agent on board simultaneously, by means of pricing and other strategies. This difficulty becomes worse where, as is often the case, one of the sides is only willing to pay little or nothing. When there are a sufficient number of consumers on this side for agents to be present on the other side, the latter are, on the contrary, willing to pay for the service. In this case the first side is said to be "subsidised" and the second is the "payer".

Two sided markets (or multiple sided markets)



What value proposition could be viable for Sportganizer?

The value proposition on the payer side therefore has to target economic agents for whom the presence, on the other side, of sportsmen and women, and their coaches, represents a value. The presence of Internet users on the subsidized side can be valued in four different ways depending on their level of implication as far as the platform is concerned. The first level concerns a qualified audience for advertising campaigns. The second can also be considered to be a qualified audience, but this time for sponsoring strategies. At the third level, the Internet users can be considered to be potential buyers for products on sale via the platform. Finally, they also constitute a community of users that can supply information on the use of sports equipment, or even contribute in the design of new products.
The difficulty for Sportganizer consisted in identifying economic agents who would value the positive cross-network effects related to the presence of a large number of platform users. Amongst the four strategies discussed, the platform managers rejected the latter two as they would both require a much larger "critical mass" of users to be viable, incompatible with the need to generate revenue fast enough to allow the platform to continue to exist. The choice that remained was between advertising and sponsoring. They both have the advantage that they can be implemented progressively, as the number of platform users increases, until the volumes of users on both sides reach a quantity which would enable more elaborate economic mechanisms to be implemented.
The next part of the chapter presents and justifies the choice of sponsorship, by showing how it can limit the negative network effects related to advertising whilst allowing the services on the "subsidised" side to be provided for free.

Sportganizer chose sponsoring over advertising

[!] Advertising is the most widespread way of funding Web 2.0 platforms

The economic model based on advertising is the most widespread of the Web 2.0 platforms (Wauthy, 2008). Online advertising is generally in the form of a banner ad, but may range from a simple text link to a video. Generally, an advertisement on the Internet provides a link to the site of an advertiser. The user simply clicks on the banner to leave the host site and ends up on that of the advertiser. The latter therefore has adverts on one or more host sites, in order to capture a portion of their audience in exchange for remuneration.
Despite a slowdown since 2008, the growth in spending on Internet advertising has largely surpassed that of traditional media. In France, advertising investment on the Internet was 3.9 billion euros in 2009 following a growth of 8.2% in 2008 despite the economic crisis. Also, 98% of the largest multi-media advertisers also communicate on the Internet[1], which shows how attractive the media has become, based on its capacity to broaden and renew targets, its reactivity and its effect on innovation[2].

Internet advertising has limits that sponsoring can compensate

Despite this, Internet advertising is far from being perfect. The cost effectiveness of sponsored links is put in doubt, primarily because of their low overall visibility and the frauds they are likely to cause (Viot 2009). The "click rate"[3] on the banners is on average well below 1%.
Moreover, online advertising is largely viewed as being intrusive, which to an extent degrades the value of the service proposed. When compared with traditional media, the Internet is more interactive and oriented towards specific tasks. Online advertising is perceived to be both time consuming and has a considerable impact on equipment (memory use, pass band…). It therefore may distract the user from the reason for which they went onto the Web and this has been accentuated by the recent use of more intrusive formats (Flash, pop-up). Due to this it has been shown that Internet users deliberately avoid publicity banners.

1 Source : http://mailing.aden-france.org/Barometre.pdf (consultation of the 2nd of June 2010)

2 Source : http://www.journaldunet.com/cc/06_publicite/epub_marche_fr.shtml (consultation of the 9th of March 2010)

3 The click rate is "the percentage of Internet users exposed to advertising content who click on it to go to the advertiser's site or who reply to the marketing message". Source: http://www.iabfrance.com/?go=editoc&eid=69 (consultation of the 15th of March 2010).

This behaviour is all the more sensitive where advertising is perceived to be an obstacle to the accomplishment of the task at hand, or where the advertising pressure is strong and the Internet user has developed a "resistance" to online adverts, due to previous negative experiences on the Internet (Cho and Cheon, 2004).
Sponsorship is a form of association involving the provision of resources (financial or otherwise) by an organization (for profit or not) to an entity (individual, organization, event) involved in a socio-cultural activity (sports, social humanitarian, arts ...) in order to achieve communication goals (Walliser, 2006). The message of the sponsor is generally implicit, as the brand name and / or business sponsor, carries with it the idea that, without this support, the essence of the sponsored entity could be threatened. For example the participation in a sports event, the presence of a team in a league or event itself might not be possible without the sponsor. Sponsoring, as opposed to the passive advertising media, accompanies a support which is actively demanded by the audience and which, generally, is well liked (ex. a football match).
Through the use of a large variety of forms of communication, sponsorship can achieve broader objectives than advertising (Fleck-Dousteyssier, 2007). The reputation and image (brand and / or business) are the most directly impacted. Relations with the various company stakeholders (clients, bankers, politicians, employees ...) are another key objective. The so-called "sponsoring of proof" is yet another in the aim of proving the legitimacy of the product through sponsored events (ex. a brand of a timer and an athletic competition).
It is to be noted however, that, like advertising, but unlike sales promotion, the objective of sponsorship is not to sell directly.
The message delivered by sponsorship is generally implicit or at least treated on a secondary level by an audience who is there first of all to participate in an event (sport or otherwise). Very little attention is accorded to the message and the stake for the sponsor is to get to the stage where the messages are treated consciously as a result of the creation of implicit messages around the brand or company. In this context, it is vital that there be sufficient congruence between the "sponsor and the sponsored". In other words, their association must be seen to be pertinent and accepted by the audience (Fleck-Dousteyssier, Roux and Darpy, 2005). In this case, the sponsor benefits from a transfer of the images associated with the sponsored organisation (or person). In addition, the intense and positive emotional context of a sports event favours the memorization of the sponsor's name and creates a situation conducive to the transfer.
These principles remain valid for Internet based sponsoring. For example, the effect of congruence on the transfer of image characteristics between the sponsored entity, the the sponsor's site and the sponsor themself has already been validated empirically (Louis, 2005). The perception of the congruence can, for example be based on the way the sponsors products are described (for example a producer of vitamins) and the section of the sponsored site (for example the health section of a site). On the other hand, the visibility of the sponsor on the site, which is by its very nature more limited than the visibility in a stadium or on a boat's sail, appears critical. This has a direct impact on the number of sponsors retained per event, which on the Internet is half that used in traditional sponsoring (Moinier, 2005). In other words, the presence of several sponsors blurs the message. This suggests that it would be important to consider how to propose some form of exclusivity to the sponsor whenever possible and, at the very least, to promote the sponsor's company or brand by making them as clearly visible as possible.

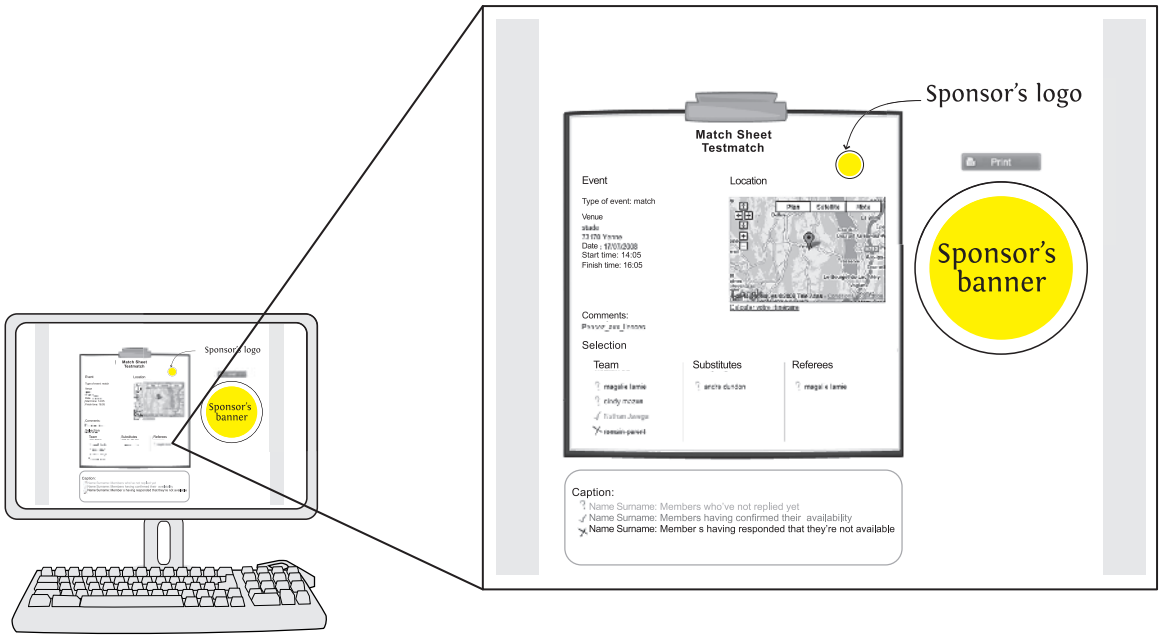
Sponsorship; the solution chosen by Sportganizer for its revenue model

These principles were implemented with the aim of presenting an innovative value proposition to the paying side of Sportganizer's market. In order to avoid sponsorship appearing as a constraint, it's important that the members of the community bear in mind that without a third party payer, the service couldn't be free. Sportganizer therefore guaranties that their sponsors won't be "...vulgar advertisers

that our users will be indifferent, or even hostile, too." The platform adopted the principles outlined above. In exchange for admission, Sportganizer offers the sponsor exclusivity on the notice to attend service (on the Match Sheet).
The partner selects, amongst Sportganizer's users, those who he wants to sponsor on the notice to attend service. The sponsor's choice is based on three criteria; the sex of the person invited to attend, their country and their sport. For example, a company could become the exclusive Sportganizer sponsor of events of the type "feminine football" in "France". These criteria allow the sponsor to ensure a maximum of congruence with the sponsored entity and, as a consequence, to better target the users of the sponsored invitation to attend. For example the choice of the criteria "feminine, football" in "France" would be extremely congruent for Nike Women (designer of products for feminine football). In order to give a maximum of visibility, the sponsor appears in each key phase of the process (Fig. 3), and in a number of different media:

- On the site during the organization of the event. The trainer is reminded that on validating a selection "a free email and SMS are sent to the selected sportsmen or women requesting them to participate thanks to the sponsor" and the sponsor's logo is displayed.
- On the e-mail and the SMS requesting the participation of the sportsmen and women.
- On the notice to participate which recapitulates all the information on the event (venue, time, team members…) and which is posted on the club's virtual display board.
- On the printable version of the notice to participate and therefore potentially within the clubs and associations where the printed versions will be posted.

Fig. 3 Example of a Match Sheet with the logo of the sponsor and the option of more space for additional offers



In this way Sportganizer offers its sponsors (at the least) the possibility to attract the attention of the targeted users whose service they've chosen to subsidize and potentially cause a transfer of affect between the site and the sponsor. If this is proven, for example through specific measures, it will be possible for sponsors to showcase their products (slots are provided on the website for this purpose). It's

surmised that this link between advertising and product sponsorship will be all the more effective as the advert will be targeted based on user profile (age, sex, status: single athlete or coach ...) and the event in which he is to participate, and that the sponsor will not have to compete with other advertisers.

Conclusion

The Sportganizer.com case highlights all the difficulties involved in building a profitable economic model for Web 2.0 platforms in a two-sided market. These platforms, whose vocation is to facilitate the "virtual meeting" of diverse economic or social actors, often face a lack of financial resources of these actors, particularly when they work in associations where volunteer work is a rule rather than an exception. The managers of these platforms therefore have to formulate innovative value propositions in order to attract the actors of the paying side of the market. On this point, the Sportganizer case provides a number of useful lessons.

Firstly it'has been shown that sponsoring can be better adapted to financing Web 2.0 platforms than the more generally used advertising approach. There is a difference in the nature of advertising, perceived as being intrusive and sponsoring, anchored into the reality and the sociocultural dynamics of the subsidised entity. From this point of view, the credibility of the sponsor is much higher than that of the advertiser. Then there's the effect of scale which allows sponsoring to be effective at different levels of investment. Sponsoring on a world scale (ex. Adidas, Emirates or Sony in the 2010 football world cup) produces returns on another scale to those that can be expected at a local level (e.g. CKT and the support provided to local amateur cycling clubs[4]) though they are of the same nature. Sportganizer can therefore attract local sponsors as well as national ones and provide them with substantially the same benefits. Sponsorship is, at last, a vector of positive cross-network effects.

4 Source: http://www.ckt-carbon.com/index.php/les-clubs-ckt.html, consultation of the 19th May 2010

It has been demonstrated that the increasing number of users on the subsidized side (sports, clubs ...) benefits the sponsors whose visibility is enhanced. The latter improve their image and benefit from transfer mechanisms mentioned above (provided they are congruent with the sport supported). More generally, their interactions with users who play sports are more numerous and, potentially, more intense and richer, which should enable them to develop new more useful forms of interaction. On the other hand the presence of publicity banners can result in negative crossed effects: the more advertisers there are (hence the more adverts) the lower the service value becomes for the audience. Sponsorship limits, or even cancels out, this effect as it doesn't produce the same phenomena of rejection by the users. Also, it may even lead to a positive cross effect, on the condition that a high level of visibility is maintained (which implies limiting the number of sponsors). Indeed, the presence of sponsors, as opposed to pure advertisers, can provide some value to the audience, which is both symbolic (through the sponsor's positive image transfer) and economic (providing a free access to a value added service and other advantages such as free trials of products).

In addition, sponsorship can be a springboard for new value propositions, which involve Internet users more. Co-innovation is a particularly attractive idea, and could be a source of value to potential sponsors. The innovation potential of the virtual community made up of the users could indeed be exploited by companies who don't have their own community of consumers, where their innovation project is close to the centres of interest of the users. In the Sportganizer case, once the two-sides of the market are "on board", it will be possible to improve the positive effects of the network by considering the sportsmen and women as sources of potential innovation for designers and manufacturers of sports equipment, for example through the use of virtual tool kits (Von Hippel, 2001). This role has already been demonstrated by a number of sports communities (Franke and Shah, 2003).

Thirdly, and finally, the characteristics of sponsorship make it a financing model (therefore a source of value), which appears promising for all Web 2.0 platforms, over and above the Sportganizer case. As has been stated, sponsoring does not convey the negative image of advertising, whose perceived intrusiveness has been measured in many sectors other than sport (Cho and Cheon, 2004). Whatever the area of activity, it allows the platform to develop and provide a service to its users, which the latter value. More generally, as sponsoring is appreciated by users, as opposed to advertising, the platform manager can bring on board actors from both sides simultaneously. The risk of generating positive crossed-network effects in one direction and negative ones the other are therefore low. For this, the congruence between the sponsor and the object of the platform considered appears essential and allows the sponsor to set up a strategy to create value through related services (diagnosis, free trials, buying online ...) much more easily and effectively. These new Web 2.0 platforms, through their capacity to improve the quality of relationships between advertisers and customers, can therefore invent new types of Business Models whose value emerges through the interactions generated between the two sides of the market.

POSITIONING A START-UP IN A VALUE NETWORK DOMINATED BY ESTABLISHED INTERNATIONAL ACTORS

Eveon, a David in a world of pharmaceutical Goliaths

Corine Genet (Grenoble Ecole de Management)
Valerie Roux-Jallet (Eveon)

Managing to evaluate the distribution of value between the various actors implicated on the creation, the production, the marketing and distribution of an innovative offer remains an enormous challenge for a start-up. This value sharing is even more difficult for a start-up where the incumbent companies are big and have high negotiating powers. This is the kind of ecosystem in which Eveon found itself, a start-up and pioneer in the design of automatic medical devices, attempting to find its place amongst the giants of the pharmaceutical industry. This case shows how a start-up can define its position in a value chain when confronted with a number of strategic options and Business Models.

One of the biggest challenges when setting up an innovation based company is how to identify, as early as possible, the business model that will enable the company to capture value from its innovation. What client segments should be targeted? What are the clients' value criteria? What key processes and resources will be required? Which partners should be chosen? How can we evaluate the value we should be able to capture? These are some of the many questions that need replies as early as possible to enable innovators to create their start-ups. Choosing the start-up's position within a value network is one of the most critical and difficult stages in business model development. The difficulty lies less in the identification of the actors involved in development, or production or in taking the innovation to market, but rather in evaluating how the value captured will be distributed between the network actors and the start-up.

Value sharing becomes even harder when it concerns a start-up faced with established actors that are big companies with huge negotiating power. This is the type of ecosystem in which Eveon found itself, a pioneer start-up specialising in the design of automatic medical devices and trying to make its name amongst the giants" of the medical world. This case shows how a start-up defines its position in the value chain, when faced with a number of strategic options that result from identified business models.

The start-up, the market and the value chain

Eveon, which means "injection" in Greek, is the name of a start-up which has developed a smart injection medical device for the safe administration of medication without syringes. The idea behind the device is based on two factors:

Traditional syringes and their modern counterparts, such as pre-filled syringes or injector pens, have major drawbacks as far as safety and reliability are concerned (One million needle stick injuries occurred in the USA in 2006 alone).

Observation work carried out on mosquitos and in particular on their sensors, pumps and sampling systems s has shown that a mosquito always manages to prick in exactly the right place, to the right depth and painlessly. As a result of this research, the founders of Eveon imagined and developed a new injection device.

A huge mature growth market with opportunities

Eveon's market is a growth market. Aging populations in wealthy countries along with population growth and improving living standards in the developing world will maintain market growth for medication and injection devices at around 5% per year for the foreseeable future. This growth is inciting governments to improve the control of health costs through the reduction of, amongst other things, the cost and duration of hospital stays. Eveon's device fits this trend perfectly as it proposes an injection solution that is entirely automatic and individualised and which can easily be self-administered at home. The first patents were deposed in 2007 and the idea became a business project rewarded by a number of prizes for innovation.

An innovative product with key benefits

Eveon's fully automatic and safe medical injection device (DMI) can be used for: subcutaneous, intradermal, intramuscular and intravenous injections and is based on four major innovations:

- **A microsystem micropump (MEMS)** enables volumes varying from from litres to milliletres be injected with precision. Adjustment of MEMS parameters allows injection times to be controlled to take into account solution viscosity and hence avoid damage to the solution's molecules through shearing. In addition, unlike mechanical syringes with pistons, injection doesn't require the use of silicon or rubber.
- **Integrated sensors** detect and analyse body tissue (thickness, depth, consistency…) in order to accurately differentiate between muscles, nerves, derm, veins etc.
- **A retractable needle**, either standard or custom-made, penetrates to the correct depth only when in contact with skin. Following injection, the needle retracts itself and is neutralised by means of a mechanical and electronic safety mechanism.
- **A cartridge** containing one or several standard vials allows for easy and cheap adaptation to existing filling lines in the pharmaceutical industry. The cartridge is adapted for both mono and multi dose products.

Large international companies and traditional solutions dominate the market

The direct competitors of Eveon's DMI are device developers such as the engineering and R&D services of large international groups like Becton Dickinson and Novo Nordisk as well as design and development companies like Ypsomed and Crossject. Suppliers are needle, sensor and micro-pump manufacturers.
The market for injection devices is mainly covered by traditional plastic syringes (85%) which are sold for a few euro cents each. In 2002 more sophisticated injection devices made up a mere 15% of the market but this proportion is growing yearly. Global growth of the injection market was +3.4% per year over the period 2002-2008 leading to a market volume of 100 billion dollars in 2008. Growth in the traditional syringe segment is pulled by that of pre-filled syringes.

More sophisticated devices anticipate market and regulatory changes

New more sophisticated injection devices aim to build on this by providing innovative solutions to facilitate treatment at home, through:

- Increase in comfort of use: less pain, ease of use (autoinjection)
- Proposing new technologies: safe needle free systems, new means of administering medication (ID)
- Adapting to new products: development of products that require fewer injections, freeze dried products

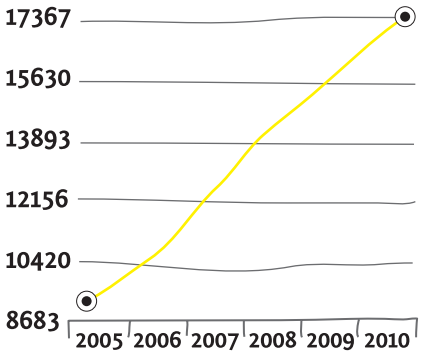
In the injection device market, the development of more sophisticated solutions is therefore stressed to anticipate and adapt to new regulations and to respond to the needs of medical staff who request safer systems and self-injection solutions.

Choosing a market segment

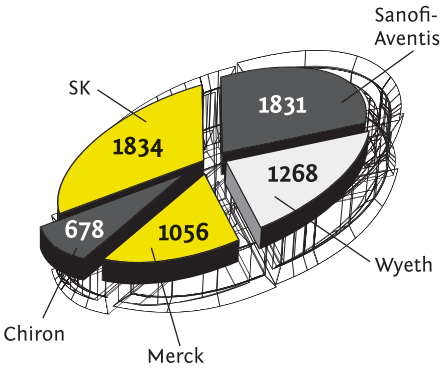
In the health sector, Eveon identified six potential applications for its injection device: biomedication, vaccines, insulin, heparin, cosmetology/dermatology, first aid for the army.

Out of these six potential segments, Eveon decided to focus on 2 priority segments the vaccine segment (1) and that of biologics (2).
The vaccine market (1), currently estimated at 6 billion euros, should go over 20 billion euros in 2012. Of all pharmaceutical products, these are the most dynamic: their sales increase by 14% per annum, twice more than that of traditional products (Joly, 2006). This market is highly receptive to innovation and the actors in the market are very interested in new medical injection solutions for their new generation of high added value vaccines (therapeutic vaccines and prophylactics for new pathologies).

The rapid rise in the vaccine market
(in millions of dollars)



The main market actors
(in 2003, in millions of dollars)



SOURCE: JOLY J. (2006) SOURCE: JOLY J. (2006)

The market for biologics (2) is the second segment retained initially by Eveon. Biologics, are made through techniques that use living resources called biotechnologies as opposed to being produced by organic chemistry, are administered for the major part by injection and are very expensive (200€/ml for Copaxone by Sanofi Aventis – multiple sclerosis - 1500€/0.5ml for Somatuline by Ipsen Beaufour – endocrinology). Biologics are used for treatments in a number of areas such as: oncology, inflammatory and auto-immune diseases (rheumatoid polyarthritis, and multiple sclerosis), infectious diseases (AIDS, hepatitis…), diabetes and cardio-vascular diseases. The biotechnology market is very dynamic with a growth rate estimated at an average of 7.7% per annum. The actors in the market are large pharmaceutical and biotechnology laboratories such as Genentech, Amgen and Merck Serono. In this high volume, high profit market with its high growth, Eveon's system provides considerable economic benefits. It would result in savings of up to 75% of the wasted volume of costly active products and would allow for shorter hospital stays as more patients could be treated at home.
The advanced technology of the Eveon solution is more adapted to the requirements of high added value treatments, as the price of the device is much less of an issue when compared to the very high prices of the injected solutions. The biologic market is therefore Eveon's priority target. A volume strategy based on domination by cost for market segments like heparin or insulin wouldn't fit Eveon's chosen position for its injection device (DMI).

FORMULATION OF A VALUE PROPOSITION

The extended value chain of the biomedical industry is very complex and the value created by Eveon's offer is different as perceived by clients, prescribers and users. The client is represented here by pharmaceutical laboratories that choose to condition their medication using Eveon systems. The prescriber is a doctor who is ready to prescribe medication conditioned using the Eveon system. The user is either a patient, or nurse, who uses the Eveon system for herself or himself, or at work.

Table 1: The Eveon system's value proposition

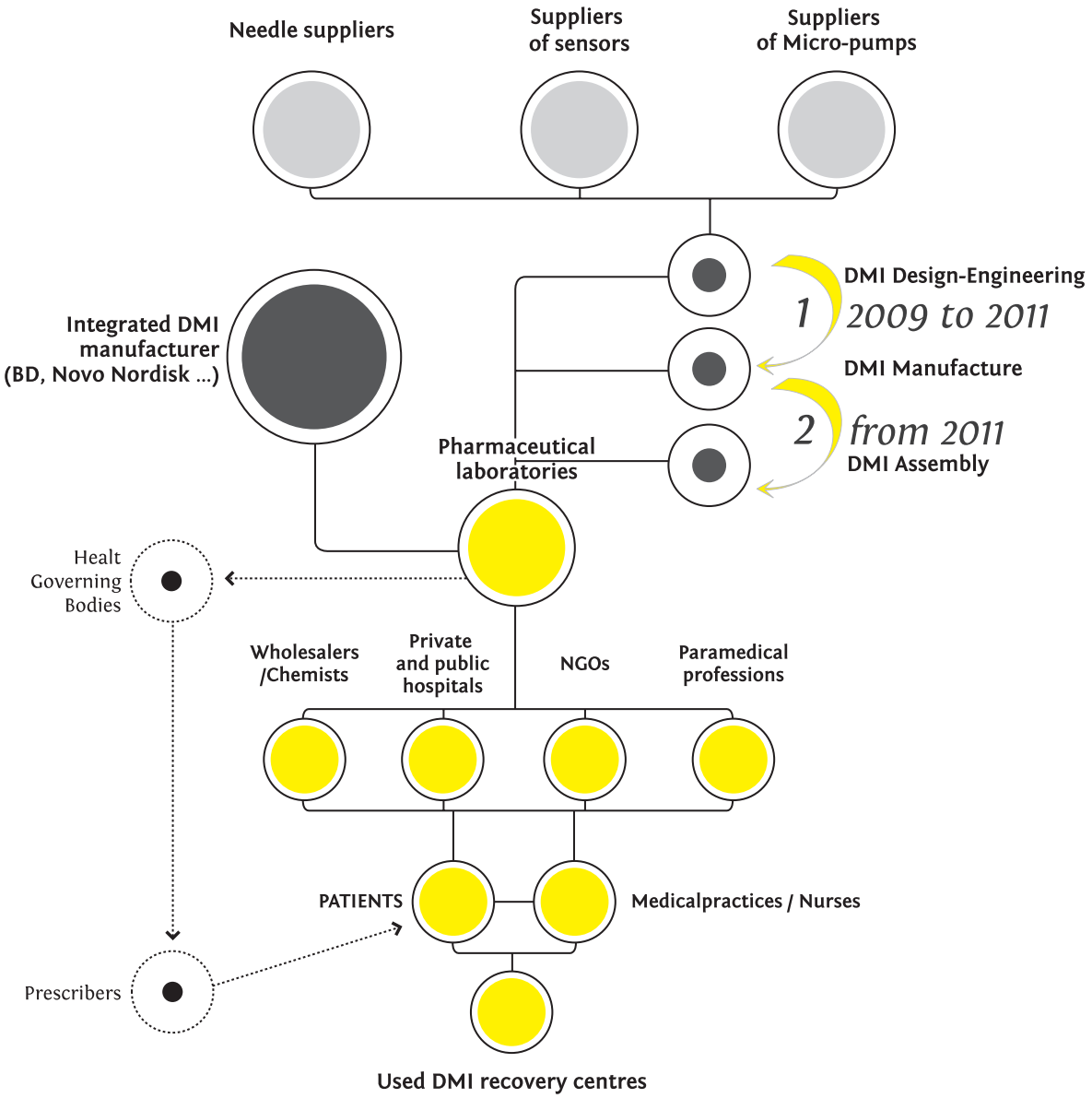
Value of the Eveon for	CLIENT Pharmaceutical laboratory	PRESCRIPTOR Doctor	USER Patient and/or nurse
Safe needle	Competitive advantage: lower risks of accidents, positive effect on reputation / image	Suppression of the risk of accidental injection of the patient	Reduced anxiety (fear of needles) Suppression of the risk of accidental injections
Ease of use: injection in 3 steps	Ease of product spreading for patients	Implementation of self-treatment by the patient Little training required and limited implication of qualified personnel	Facilitates use: enables auto-injection at home
Automatic tissu recognition	Differentiation through technology	Guaranty that the injection be done in the right place ex. avoiding veins	Facilitates use Auto-injection at home
Minimal waste volume	Savings through less product waste	Of little interest	Of little interest
Precision of volume injected	Competitive advantage : optimisation of medication efficiency at a lower cost	Guaranty that the DMI treatment corresponds to requirements	Overdose impossible Limited secondary effects

SOURCE: ROUX-JALLET (2009)

FINDING A POSITION IN THE VALUE NETWORK AND VALUE CAPTURE

Eveon, having selected a target segment and having formulated a value proposition now had to define what value the company would be able to capture from the network of medical device manufacturers. To do this, Eveon's value network was modelled. The network covers all the actors involved in both development and production as well as in taking the product to market. It includes a number of actors from the extended value chain which covers suppliers through to distribution, and includes competitors and "transformers" (suppliers of complementary products or services). In addition to these actors other stakeholders are included such as prescribers and other market influencers like health governing bodies (Cf. diagram).

Figure 2: Value network of manufacturers of medical devices

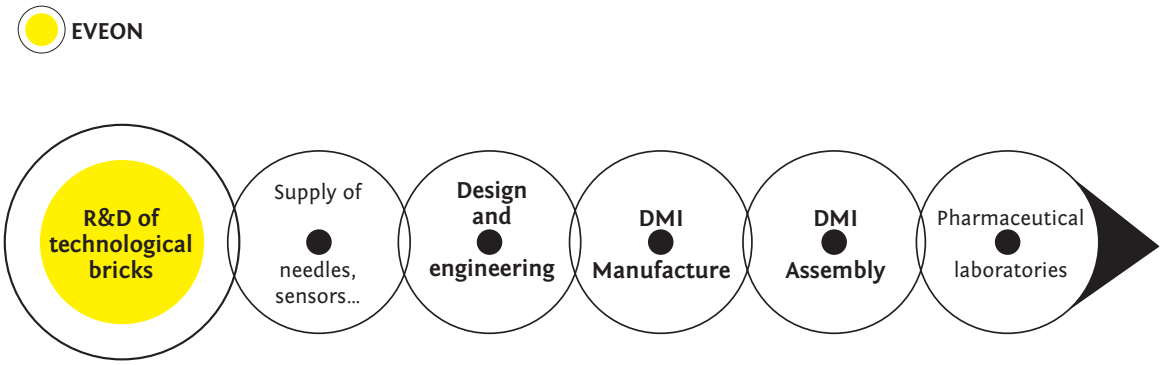


SOURCE: ROUX-JALLET (2009)

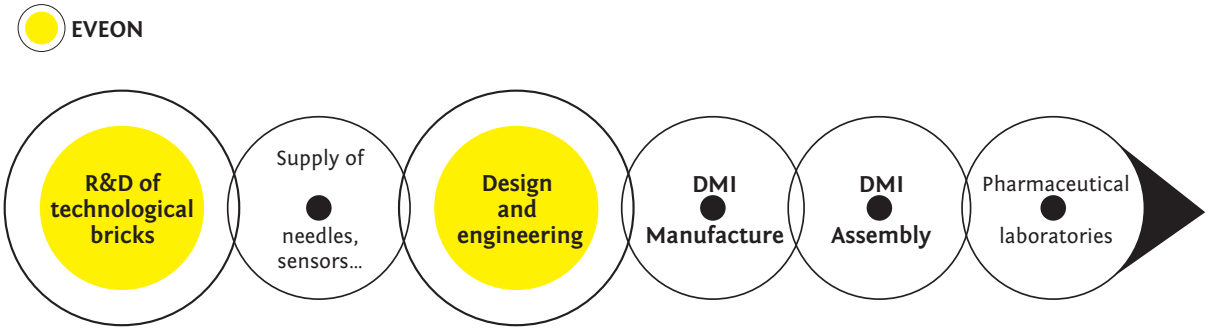
From the above medical device manufacturer value network, Eveon can identify a number of potential positions:

- *R&D Company*: Eveon would sell its know-how (6 patents) in the form of industrial licences. A large part of the value created by Eveon would be captured by the buyers of the technology who would then be able to develop its potential. Eveon would become an R&D company whose survival depends on its capacity to innovate and sell its patents.

Integration of Eveon into the extended value network as an R&D Company

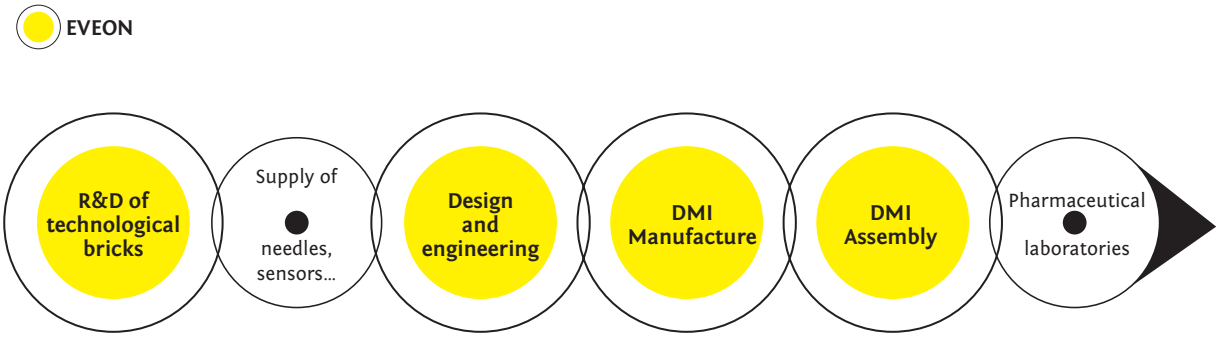


| *Engineering company*: here Eveon would develop "customized" DMI solutions for pharmaceutical laboratories. The value captured by Eveon would be low in comparison to the value captured by the clients i.e. the pharmaceutical laboratories, and DMI manufacturers. However, this position would allow Eveon to avoid heavy investment in industrial infrastructure though on the downside over time it would also result in the risk of know-how transfer to the manufacturers of DMIs.



Integration of Eveon into the extended value network as an Engineering Company

| *Integrated company (design, assembly, distribution)*: here Eveon would sell assembled "customized" DMIs to their clients. To do this Eveon would have to control each step of the product value chain. The position of integrated company would enable Eveon to capture practically all the value generated by its innovation. It would also, however, require considerable additional financial resources and assets.

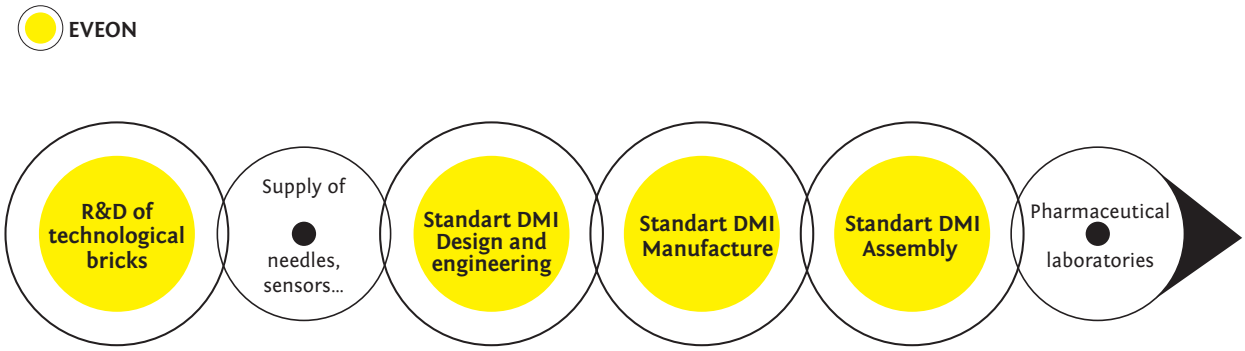


Integration of Eveon into the extended value network as an Integrated Company

| *Standard DMI manufacturer*: here Eveon would manufacture a range of standard DMIs suited to all medication which would then be distributed through chemists. The large scale distribution of the product would depend on the acceptance of the product by both prescribers and patients and would increase the value created

and captured by Eveon. The start-up would not only have to control all stages of the value chain, but also have to compete in a highly competitive volume mar ket where competitive advantage is price based. This position would require a high initial investment.

Integration of Eveon into the extended value network as a Standard DMI Production Company



Based on the potential value capture in each of the four potential strategic positions and with their associated constraints, Eveon chose to become an integrated company from 2011 with an initial transition phase between 2009 and 2011. Over the transition period Eveon decided to concentrate on engineering and on the co-development of customized DMI solutions.

How Eveon's strategic choice was made

The following two paragraphs analyse Eveon's strategic choices. The analysis highlights the reasons for their choice of position in the value network through a strategic trial and error approach and using Teece's model (1986).

Value chain positioning by strategic trial and error

Using a case study based on a start-up in the area of numerical cinema, Bathelemy and Paris (2006) highlight the difficulties involved in developing a business model for a start-up. To do this the authors use the notion of strategic trial and error which considers how a "start-up tries to seize all the opportunities it can. This enables it both to test the economic model and to learn more about some of its dimensions". According to the authors, the invention of a business model can only be based on strategic trial and error. This is explained by the large number of unpredictable external factors inherent in the construction of a market such as the reaction of consumers and the launch of new offers by competitors.

Eveon's temporary business model and strategic trial and error

In addition to the strategic trial and error process, is added an opportunistic learning process: the company positions itself on a "temporary" model and waits for the market to structure itself, ready if necessary to adopt another higher potential one.

Eveon's choice of position on the value chain is partly a result of this process. Due to the high uncertainty around such factors as: the reaction of consumers towards their products, the readiness of their clients to accept the introduction of DMIs into their markets, or even the need to make money, Eveon chose a transitory position, that of engineering and co-development of customized DMIs, before going on to become an integrated company. This "temporary" position in the value network must enable Eveon to implement its strategy of alliances with its clients and suppliers and to progressively internalise key competencies that the company will need to become an integrated company. To manage this transition Eveon will have to be flexible in order to adapt to clients' needs, to respect constraints related to profitability and to be able to seize all opportunities that may come up. It's in this sense that the strategic positioning of Eveon in the value network can be qualified as being a result of both strategic trial and error and opportunistic learning.

Capturing the value created by innovation; the use of Teece's model

One of Teece's major articles (1986) shows the relationship between value creation and capture. To do this, he develops a framework in order to understand why, and under what conditions, innovative value creating companies fail to capture the value of their innovations whilst their clients, imitators or other actors in their industry benefit. He highlights the role of possession of complementary assets, appropriation levels and considers the maturity of the industry concerned. He identifies two key factors which help explain value capture resulting from innovation:

- The appropriation level: this corresponds to the ease with which a given technology can be imitated. For Teece (1986), a company with a low appropriation level implies that its technology can easily be imitated, the value capture created through innovation is therefore uncertain. On the other hand a company with a high appropriation level makes technology that's difficult to imitate, the resulting capture of innovation created value is therefore ensured. According to Teece (1986), the appropriation level is stable and depends on exogenous elements notably the nature of the technology itself and the type and level of Intellectual Property Rights protection adopted.
- Complementary assets and the reliance of the innovation on the assets. Distribution channels, marketing competencies, image or production capacity can be considered to be complementary assets. To innovate, the company can't just count on itself but has to be able to access resources it doesn't own, but which it needs. Access to these resources (including all the competencies that the company needs to exploit a technology), is a key element for a start-up in ensuring its ability to make its technological innovation available to the market.

These two factors of Teece's model determine who will be able to capture the value created through innovation (Cf. Figure 3).

Figure 3: Who captures the value created through innovation?

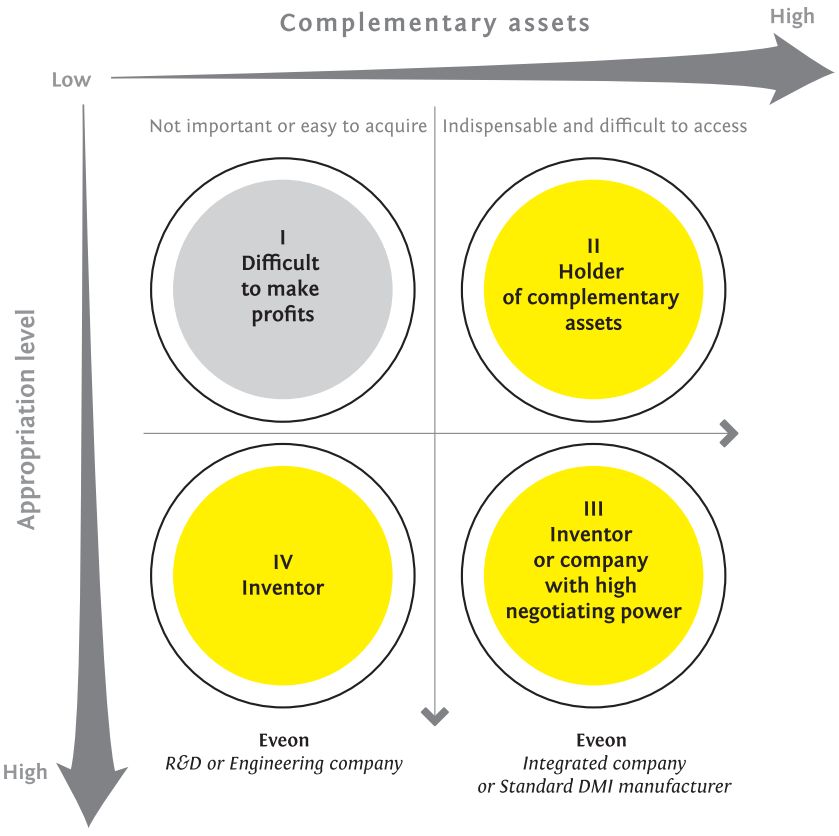


Diagram adapted from Afuah (2003)

- When both the appropriation level is low and the need for complementary assets is low, the technology can easily be imitated and the innovator will find it difficult to make profits (Diag. box I). On the other hand, if the need for complementary assets is high and they are difficult to access, then whoever controls the assets will capture the value resulting from the innovation (Diag. box II).

- In the case where the appropriation level is high and complementary asset requirements for the innovation are low, or easily accessible, then the innovator captures the created value (Diag. box IV). However, where complementary asset requirements are high and access to them difficult the value will be captured either by the company with the strongest negotiating power, or by the innovator (Diag. box III).
- On this basis, Teece defined strategic and organizational decision making models for companies. He notably formalised a decision making process with the aim of choosing between development of innovation internally (Diag. box I) and the setting up of cooperation (Diag. boxes II and III).

Eveon; a high appropriation level, but what position...?

In Eveon' case, the appropriation level is high being based both on the six international patents which cover all the technological aspects of the innovation and on the high level of expertise involved. However, the need for complementary assets varies considerably depending on the position chosen in the value network.
The need for complementary assets is low if Eveon decides to position itself as an R&D or an engineering company but high if Eveon adopts the position of an integrated company or manufacturer of standard DMIs. In the latter two cases, complementary assets such as distribution channels or production capacity will be required and Eveon will be dependent on its clients, the large international pharmaceutical laboratories i.e. if no medication is conditioned in DMIs, the DMIs won't be sold. On the other hand, the laboratories wouldn't be able to make their medication as largely available without using the Eveon DMI, the latter being the only device capable of injecting either extremely small doses or enabling self-injection for intra-muscular injections, nor would they be able to benefit from the cost reductions due to less loss of expensive solution using the DMIs.
Eveon will be dependent on industrial partners for its production capacity, partners such as MEMS manufacturers, manufacturers of sensors, integrators etc. To build its position as an integrated company, or manufacturer of standard DMIs, Eveon will therefore need to ensure it has access to these complementary assets. To do this Eveon will have to set up partnering strategies with its clients, the pharmaceutical laboratories, who control the distribution channels. The innovation value captured by Eveon will therefore depend largely on the contractual conditions that the company will be able to negotiate.

Conclusion – Will David beat Goliath in the end?

Like David facing Goliath, Eveon succeeded in adopting a strategic position which avoids having to confront its large international competitors head on, a confrontation that Eveon would be sure to lose. The strategic position of Eveon is firstly based on the targeted segment to access the market: the segment, which is much more demanding as far as technology is concerned, but also less sensitive to price and currently relatively undeveloped. It's also based on the choice of position in the value network. Though it would have been easier to choose the position of an R&D or engineering company (as both activities require relatively low investments in industrial infrastructure) Eveon chose the position of an integrated company. Becoming an integrated company will enable Eveon to capture almost all the value generated by its innovation. However, this position requires that Eveon access a number of unavoidable complementary assets such as the distribution channels, which are currently controlled by their main clients: the giant pharmaceutical laboratories. The share of value captured by Eveon will therefore depend on its capacity to negotiate with these large multinational groups. Will David manage to beat Goliath in the end?

BUSINESS MODEL PROTOTYPING TO IMPROVE VALUE CAPTURE

Schneider Electric going from product to solution in the energy efficiency market

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In some cases, the value brought to the end-customer by an innovative value proposition is quite obvious due, for example, to the quality or originality of the offer, but what is really at stake for the innovating company, is how it will be able to capture a sufficient amount of the value for itself. This chapter shows how Schneider Electric has designed an innovative business model to capture value through a smart solution dedicated to energy efficiency. The method presented here involves the formalization of a value proposition, storytelling around how the value is to be delivered, the mapping of complex value networks and finally a financial simulation tool to identify where the value is in the network. This approach was carried out within an innovation team to share future business hypotheses and is typical of can be called "Business Model prototyping".

Over the past few years Schneider Electric has being changing its strategic vision; the electrical equipment manufacturer now aims to become a world leader in energy efficiency solutions. This entails designing and developing global offers that associate equipment, software and services and then marketing them profitably worldwide. This will be done in a context where other large international groups, from both the energy sector and outside (ex. Google), are directing their strategies towards similar subjects related to economising energy. It is a challenge for the various divisions of the group and more particularly for the teams involved in innovation as they will have to design and develop innovative offers, aligned with this new vision, that differentiate the group from its competitors. In this context, the Industry Innovation Team is working to develop new offers for the group's Industry business. The team's role is to propose innovative concepts, explore their technical and market feasibility and then transfer them to the operational divisions for industrialisation and market launch. The task isn't easy as the more innovative the concepts, and the further their Business Models are potentially from those of the Business Units, the harder it becomes to convince the Business Units to adopt and use them. The team therefore has to be both good at explaining the innovations, and selling them internally, that are deemed the most promising and most closely aligned with the group's strategic vision.

The team has identified a technical solution, baptised "Calorie", which improves the energy efficiency of refrigerating machines. The Calorie case illustrates the difficulties encountered by innovation departments when transferring an innovative concept to an operational division by proving its value potential. The methods used for this case are based on the notion of strategic prototyping developed by Chesbrough and Rosenbloom (2002). Strategic prototyping involves modelling and testing various Business Models around a technological brick. To achieve this, we used both storytelling and the mapping of value networks to develop the first financial simulations based on revenue generation hypotheses. The approach described combines what Joan Magretta called the "narrative test" (checking that the story of the value proposition and the Business Model makes sense) and the financial test (simulation of several hypotheses to ascertain the potential levels of value capture for the retained Business Model options).

The chapter begins by presenting the strategic context, the characteristics of Calorie and then moves on to describe how the Business Model prototyping was done. We'll conclude on what benefits this type of approach can provide to those involved in imagining offers which challenge the established Business Models of large groups like Schneider Electric.

1- Calorie: a promising energy efficiency solution which challenges Schneider Electric's established Business Models

Calorie's strategic context

The Schneider Electric group with its new strategic vision Schneider Electric, a company present in over 100 countries, markets integrated solutions for a number of market segments with the aim of providing safe, reliable, efficient, productive and green energy. Schneider Electric is leader in the energy and infrastructures markets, industrial processes, building automation, data centres and networks and is well-positioned in residential applications. With 15.8 billion Euros turnover in 2009, the group has over 100 000 employees throughout the world.
Schneider Electric has initiated a considerable change in its strategy and now aims to become one of the world leaders in Energy Efficiency. The group became more and more aware of the increasing importance environmental issues and the fact that the group's know-how equipped it to propose innovative offers in phase with sustainable development concerns.

In Schneider Electric, the Industry innovation team explores new values in order to develop new offers for the industry activity. This small team includes engineers and marketers and uses creativity techniques and upstream marketing (research, concept testing by focus groups, exploratory interviews, etc.). Since the team has re-orientated its activities, in response to the group's new strategy, it has had to rethink how it works and what tools it uses. Now the work carried out in exploring and designing doesn't only involve research in technology and upstream marketing but in addition strategy through business model prototyping.
The Calorie case illustrates this evolution, involving a promising new technology, which generates high client added value (through substantial economies in energy). However, if the technology is to be made available through the company's existing Business Models, the value captured by the group would be far too small in comparison with the value created for the client. The Industry innovation team must therefore be able to design Business Models that capture the maximum amount of the value created for the client.

The high added value resulting from the technology innovation in Calorie is under exploited

The innovation team has been exploring the area of energy efficiency and focussing more specifically on refrigerating and HVAC[1] machines. These machines are high energy consumers. They are to be found in cold rooms, air-conditioning systems or cooling systems (for example those used in data centres and in industrial processes in the pharmaceutical and agricultural sectors). Making these machines more energy efficient has become a large stake from the sustainable development point of view.
A research engineer in the innovation team has been working on the performance of refrigerating machines. He developed a "control box" based on complex simulations which results in reductions in energy consumptions of up to 10% on average. The number of potential applications is considerable. However, the decision was made to focus the exploration on Business Models related to air-conditioning in the tertiary sector as the company already provides solutions for manufacturers of HVAC machines.

1 Heating Ventilation Air Conditioning.

The Calorie solution, dedicated to air-conditioning systems, consists of a control-box including software which controls machines and allows for improved system regulation. Tests have shown that the solution allows for annual energy savings of up to 2 000 Euros for a building of an average surface of 4 000m2. This gives an indication of the value created for the person who pays the energy of an average sized building: 2 000 Euros per annum are saved or 10 000 Euros over a five year period.

Schneider Electric doesn't have direct access to the diffuse market of the occupants of tertiary buildings. Manufacturers of HVAC machines could be interested in integrating the Calorie solution into their offer. The Calorie project manager therefore met up with a number of people working for HVAC manufacturers to present the solution. They declared their interest in integrating the solution into their machines but for a cost of no more than 400 Euros.

The Schneider Electric project manager presented these first results to his hierarchy. The manager carried out a quick calculation: a solution that resulted in recurring economies of 2 000 Euros per annum for the customer but only 400 Euros of captured value for the supplier was certainly based on the wrong Business Model! The Calorie project team then had to explore alternative Business Models for the Calorie Solution, which would allow more value to be captured.

After reflexion, the project manager understood why the HVAC manufacturers weren't willing to pay a higher price for the solution. It was simply due to the fact that the solution didn't interest their direct clients.

In the building trade, actors that pay investment costs related to the building design and construction (called CAPEX) are generally not the same as those who pay for the running costs of the building which are related to building maintenance and operations (called OPEX). The promoters attempt to minimise the construction costs in order to improve their return on investment. On the other hand, the management and maintenance costs are born by those who occupy, own or rent the building and they are unknown at the time of construction. In some cases, the management can be delegated to a building manager or facility-manager[2] or even an installation company for the heating / air-conditioning part. The latter also do all they can to minimise the OPEX.

There is therefore a conflict of interest between the actors that pay the cost of the investment and those that pay the operational costs. As the investment precedes operations, the promoters optimise the costs that impact the purchase price, in m2 of their products. For this reason the machine manufacturers resist anything that will result in an increase in the price of his new machines. On the other hand, the value generated by the Calorie solution directly concerns those actors that pay for the buildings' energy bills. The key is therefore to find a way of targeting these actors directly to optimise the value captured.

The project manager therefore contacted a number of building managers who showed considerable interest in the solution. A number of them even had specific objectives related to the reduction of their electricity bills. A study carried out by the group showed that energy efficiency was one of the few levers available to reduce electricity bills. As operations costs are carried over from year to year, and often don't take into account such things as inflation, those who manage these budgets prefer to lower energy costs rather than other expenses, such as maintenance costs, which are harder to reduce. Some of them indicated that they would be ready to invest in energy efficiency solutions that provide a 2 to 3 year return on investment. In other words, an office building manager is willing to invest between 4 000 to 6 000 Euros per year for a solution that results in a 2 000 Euros cost saving. This is considerably more than the 400 Euros that machine manufacturers were ready to pay! Having obtained these elements, it became clear that the Calorie offer should target building managers. It was then decided that existing installations should be targeted as well as new machines. The market for existing machines is considerably the larger, but entails adapting the machines to incorporate the Calorie solution. In technical jargon, this is known as retrofitting.

To give an indication of the market size, in France alone it is estimated that 50% of existing buildings will still be there in 50 years, retrofitting existing machines

2 The facility managers are specialists that replace the support services on behalf of companies. They're range of services is very broad (going from technical management of buildings, maintenance, management of green-spaces, security, canteens...).

therefore represents a considerable potential market. For the building manager, it results in the improved efficiency of HVAC machines without having to replace them. To put this into perspective, for a 4 000m2 building, which corresponds to an average sized office building, an HVAC represents an investment of around 30 000 Euros (excluding installation costs).

2- The Calorie business model exploration method

The Calorie case is a test case for the Industry innovation team who has to find a solution to capture sufficient value from the innovation to be acceptable to the company. This is what we call here, strategic prototyping, in the same way that we talk of prototypes for new products during development. According to Chesbrough and Rosenbloom (2002), strategic prototyping aims to produce the first hypotheses on how value will be created and captured around a value proposition. At this stage it doesn't mean having to build a detailed business plan but rather to get an idea of the figures involved and to identify the most promising value propositions. The next section describes the approach used in this case.

2.1. Definition of innovative value propositions

The approach in four steps:

1. Define the innovative value propositions for the clearly identified targets.

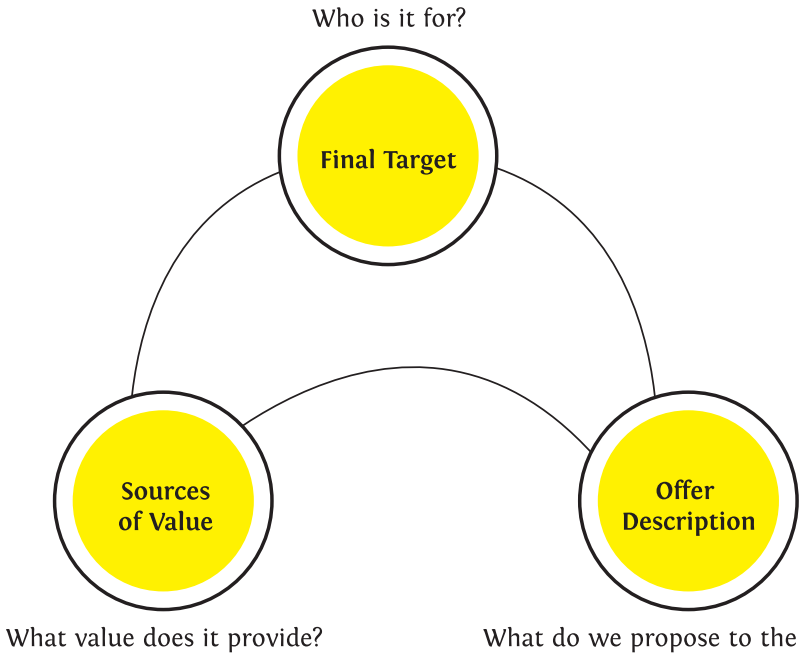
2. Tell the "business stories" behind each value proposition which describe how the value proposition will be brought to the client.

3. Map the value networks to identify value flows from the end-customer through all the actors of the value chain and think about the different value sharing mechanisms involved.

4. Carry out financial hypotheses and test the viability of the identified prototypes Business Models.

The definition of the innovative value propositions followed the following logic (Fig. 1)

Fig. 1. Presentation of an offer with specific target(s) and clearly defined value criteria



The work group noted that it is hard to reply to these questions in order. The questions are in fact all interdependent and the reasoning needs to be done in a loop where the offer, the end target and the sources of value are linked. The group

went through several iterations that we won't develop here, suffice it to say that the final target changed several times during their analysis.

The final target:
These are people in charge of the technical management of buildings of around 4 000m2.
They manage existing installations and deal with the payment of the energy bills. The segmentation by building size can be explained by the need for this target to minimise operational costs. Below 4 000m2, efforts spent in improving energy efficiency are considerably less. On the other hand for large buildings a number of tailored energy management solutions exist. The medium sized building segment therefore appeared the most adapted to this new offer.

To describe the value proposition i.e. the sum of the various components of the offer which add value from the targeted client's perspective, we suggest using Kaplan and Norton's (1996) representation, distinguishing between the elements that contribute to value creation: the characteristics of the product or service, the image (brand, certification, etc.) and the dimensions of the client relation that create value.

Description of the CALORIE offer:
Characteristics of the product and service
- The technical device which regulates the running of the HVAC machine
- The algorithms and software necessary to define the parameters for the machine
- The installation by retrofit of the device

The image
- The Schneider Electric brand
- The certification of the product by certification organizations

The client relation
- The sales process
- The after sales service

The sources of value enable the innovative character of the offer to be checked in comparison with other rival solutions. In this instance, for the moment, no substitution solutions for the Calorie device exist.

The sources of value for the final client:
- Calorie is a system that allows economies of around 2 000 Euros per annum to be made for a building of 4 000m2.
- Improved control of the machine reduces risk of breakdown. The device therefore increases the lifespan of the machine.
- In the targeted companies, equipped with the device, the promotion of actions to improve energy efficiency could create the feeling of working for a more eco-aware company.

Formulating the value proposition allows us to focus on the main points that create value for the targeted client. However, at this stage, the way in which the value will be brought to the client still remains to be defined. This can be done through creating a story around the value proposition.

2.2. Storytelling the value proposition to make potential Business Models emerge

For Joan Magretta (2002), defining a business model means telling a plausible story, which explains how the company will go about delivering a value proposition. In strategic projects the writing-up of the story enables a work group to create a shared representation of the strategic choices to be made, to share hypotheses and to

test the plausibility of the hypotheses.
The creation of the storyline is based on canonical forms of stories that we have all known since our childhood. The Greimas model (1966) gives a basic structure for any story, where the mise-en-scene of all stories involves a hero pursuing a quest. In the quest the hero meets obstacles (or opponents), but also objects or people who help (or stimulate). If we apply these basic principles to the creation of the story of the delivery of the value proposition, the hero of the story is the company. The quest is to capture value in an uncertain context surrounded by opponents (competitors, technical difficulties, lack of financial resources, etc.). The story needs to identify the stages that have to be gone through and the stimulators (internal resources, partners, etc.) that will enable the project to succeed.
The Calorie case was transformed into a story along the following lines by the work group. The insert below summarises the story that was written.

Schneider Electric wants to profitably market the Calorie device to managers of buildings of around 4000m2 *(main quest)*. Calorie is a system that enables electricity costs to be reduced by 2 000 Euros per annum for a building of around 4000 m2. However, to succeed in the quest the company needs to solve a number of problems. Firstly, the targets are diffuse and the company doesn't have distribution channels to reach them. Therefore, how can we reach them (secondary quest)?

Air-conditioning installers are companies that carry out the maintenance of HVAC machines. They have access to the clients and could be used to install the device. They are also generally competent in plumbing and mechanics though don't have many electricians. Unfortunately, to install the device a minimum of electrical know-how is required. As a consequence, Schneider Electric couldn't exploit this existing network as it stands. These installers will need to be trained by Schneider Electric who will provide them with a seal of approval

In the case of the French market, the energy suppliers could be prescriptors for the device as they are strongly encouraged by the state to implement energy performance actions for their clients. However, to be referenced by these energy suppliers the solution has to be certified. This means that Schneider Electric will have to set up actions to certify the solution with the competent authorities.

Once trained and with Schneider Electric's seal of approval, the installers will be able to prospect the potential clients in the geographical zones allocated to them. They'll promote the Schneider Electric brand and the certification of the Calorie system as proof of its quality. The installer will defend the client values: reduction in energy costs, increase in machine life, the Schneider Electric seal of approval, the image. In addition the client would be even more inclined to purchase this solution due to tax incentives form the local authorities.

When a convinced client decides to purchase the solution from an air-conditioning installer, the installer will procure the relevant parts from a local distributer and download the required software and drivers via Internet to programme the device. These software drivers require that the technical parameters on the running of the machine, which are specific to each model of machine, be recorded. Schneider Electric will have to buy this information from the machine manufacturers who will be interested in the distribution of the system.

It is in the inter-season that the installers will carry out the *retrofit* which entails a machine shutdown. The client will pay the equivalent of two years energy savings in one go, equivalent to around 4 000 Euros. In the event of technical problems, the client will contact the installer for the maintenance of the system.

We obtained a scenario where a number of different means were found (stimulators) to deliver the value proposition. At each stage, the obstacles (opponents) are identified and the group has to look for plausible solutions so that the quest can continue to progress. The story telling exercise ensures that important issues for implementation of the solution aren't forgotten. The story as it stands makes sense to the work group and can serve as the basis for the communication of the concept to deciders who will have to rule on whether to deploy the project or not. Having said this, this story doesn't tell us whether the Business Model defined will be economically viable over time. The final two stages of the approach aim to validate the economic viability of the defined scenario and from there chose the most appropriate Business Model.

2.3. Translate the scenario into a map of its value network

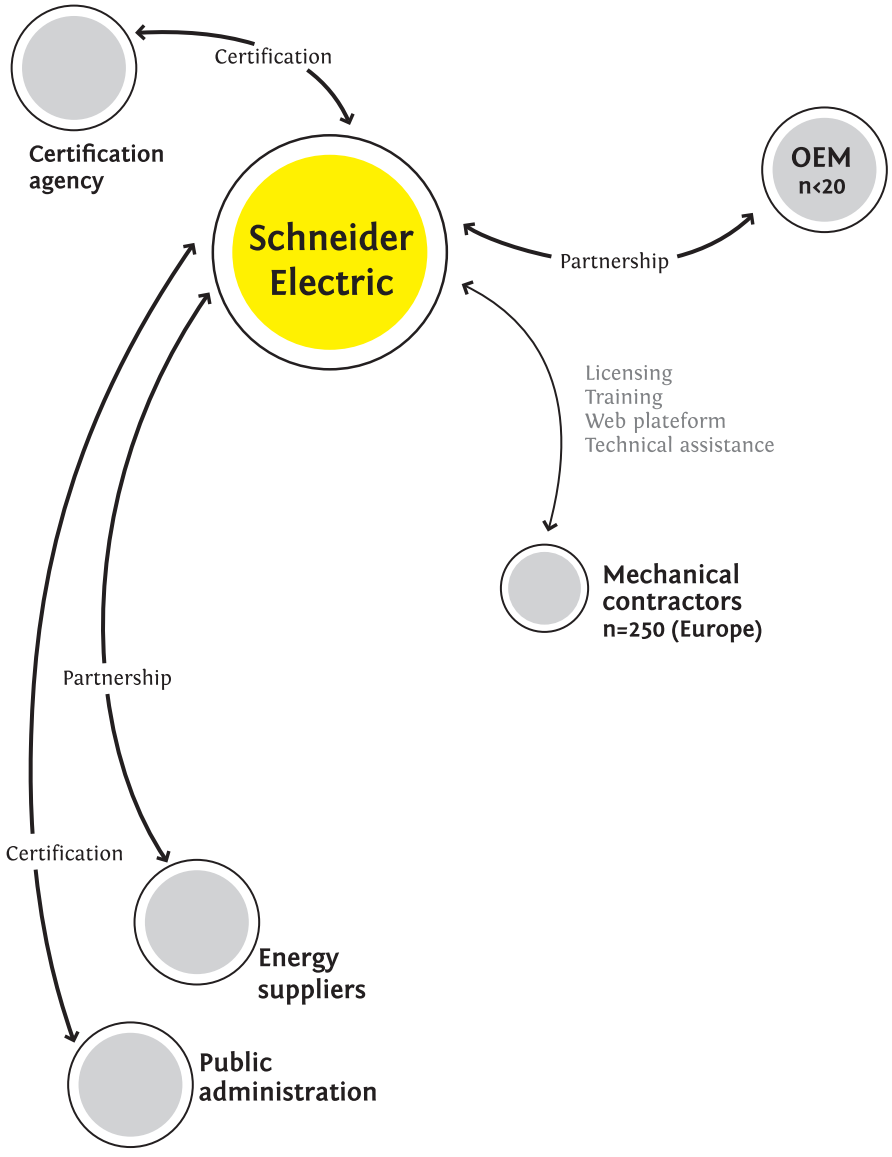
The line of argument defending a disruptive Business Models for the deciders requires economic justification. As indicated by Magretta, previously cited, this means making the link between the story being told and a revenue model that's viable for the company. However, putting figures on a story, such as the one presented here, isn't done directly. An intermediate modelling step is required which involves identifying all the actors who have a role in the value chain and the relationships that exist between them. If we consider a Business Model as being based on business logic and that it enables us to create and capture value from a value network, we can understand the importance of the value network in prototyping of the business model. The value network allows us to visualise the co-opetition games that exist between the actors in the network who can cooperate in the creation of value but be in competition in the distribution of the value produced (Brandenburger and Nalebuff 1995; Vanhaverbeke and Cloodt 2006).
We developed a model to graphically represent the value network. The model is based on a number of tools presented in literature on the subject (Brandenburger and Nalebuff 1995; Allee 2003; Chesbrough 2006; Jouison and Verstraete 2008), but we took it further to take into consideration a number of specific aspects involved in this case. Notably, we distinguish the difference between the actors that are necessary to implement the Business Model (1), who will be directly implicated in the delivery of the value proposition (2), the flow of financial value (3) and the actors who facilitate the diffusion of the offer (4).

(1) The actors and the relations required to set up the Business Model
The discussions that took place during the writing of the story brought to light the different actors involved and specific relations of a type that literature on value networks doesn't treat. The actors concerned were those required to set-up the business model. The actors are necessary and agreements have to be obtained with them before being able to launch any kind of activity. The relations can take the form of certifications or approvals obtained from one organisation or another, technology or sales partnerships, training to be approved, franchises, etc. In the Calorie case, the actors and the actions identified by the working group are as follows:

- Train and authorise a network of air-conditioning installers.
- Set-up a web based platform from where software and drivers can be downloaded by the authorised installers.
- Supply technical assistance to the installers where they encounter problems in the field.
- Certify the technical solution by a certifying organisation.
- Negotiate partnerships with energy suppliers and ensure that they become prescribers of the solution with their clients.
- Set-up partnerships with HVAC machine manufacturers in order to obtain information required to set up the parameters of the machines in exchange for payment.

These actors and their relations are important elements and help structure the implementation of the business model. They provide what can be termed as being the backbone of the value network that will have to be set up to deliver value to the targeted clients. Setting up the backbone can result in competitive advantage for the future. These relations condition in part the access to external strategic resources that can form entry barriers of potential competitors. For example organising and setting up a network of competent and trained installers would be hard for a follower. On the other hand, these relations structure and engage the future of the company's activities related to this solution. Their deployment will require significant investment. For example, the certification of a network of installers will entail canvassing air-conditioning installers in a given area, evaluating their competencies, then defining and setting up procedures to approach and canvass clients and then deploying them and training the installers on their use.

Fig. 2. The structure of the value network



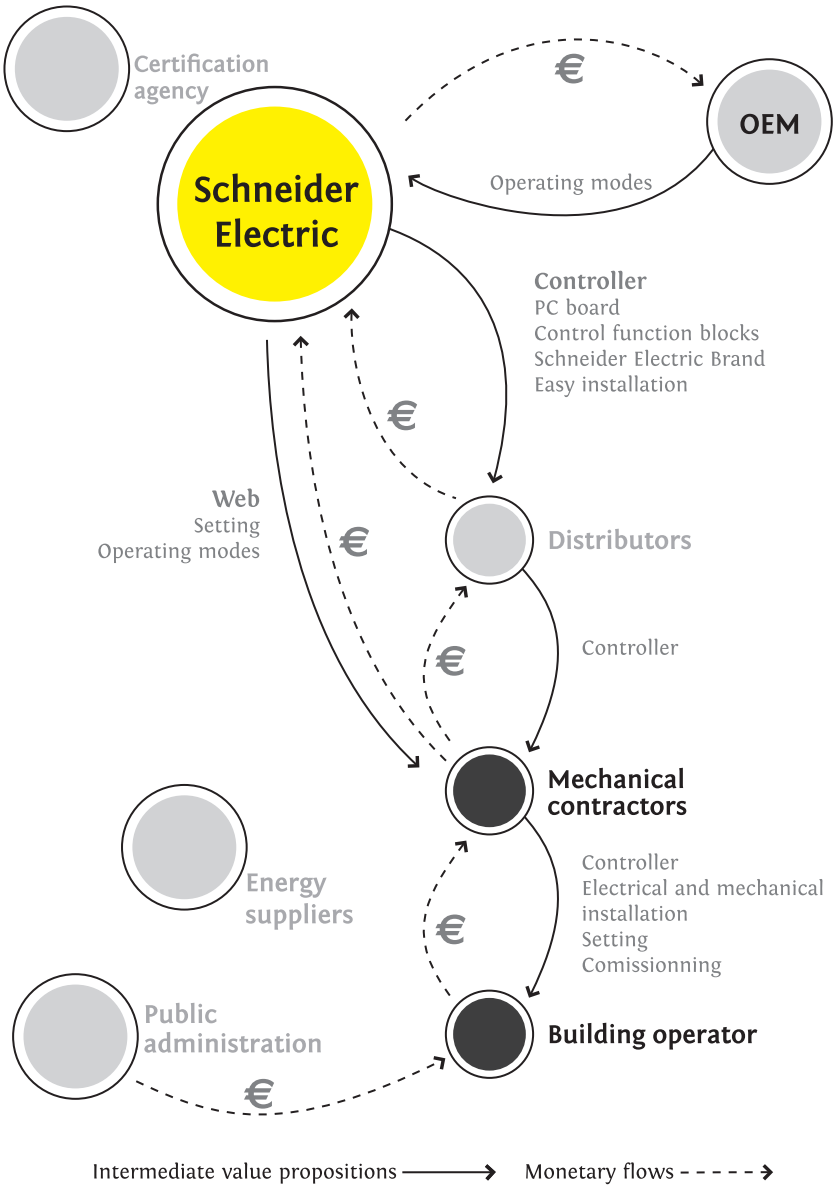
(2) The actors and relations implicated in the delivery of the value proposition

The backbone of the value network having been defined, the next stage involves identifying the actors involved in the delivery of the value proposition and the relations between them. It also involves defining the position of Schneider Electric in the network. It is the heart of the value network as usually described in literature (Fig. 3).

Several actors contribute to the delivery of the final value proposition as defined in the scenario. This final client value proposition can be broken down into intermediate value propositions, which describe the content of the offer that an actor delivers to an actor who is next downstream in the network. For example, in the relationship between Schneider Electric and the installer, Schneider Electric will have to supply an easy to install control box to electrical equipment distributors along with necessary procedures to facilitate adjustment work to be carried out on the machine. Therefore, in addition to the value provided to the final client, we need to think of the value provided for the intermediary.

(3) The financial flows
Generally speaking the intermediate value propositions involve financial compensation related to the revenue generation models. The quantitative study of the mechanisms of creation, sharing and capture of value will be the subject of the next stage.

Fig. 3. Intermediary value propositions and monetary flow



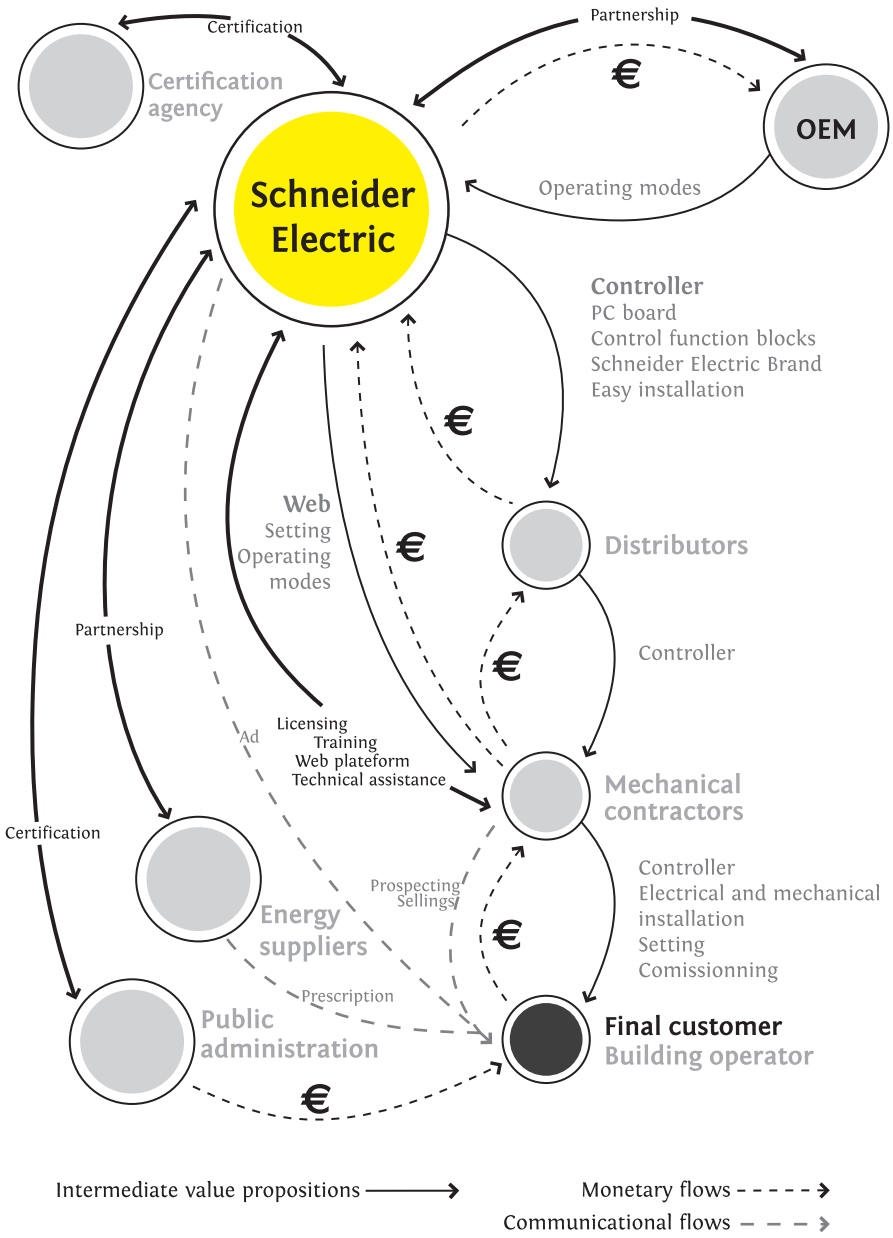
(4) The communication flows

The image or communication flow (Fig. 4) designates the communication actions that will facilitate the diffusion of the product. It can involve publicity campaigns ("pull" marketing strategies[3]) or prescribing and canvassing ("push" marketing strategies[4]). In the Calorie case, we opted for a "push" strategy to conquer clients by two means: via energy suppliers incited to prescribe the Calorie device and via the air-conditioning installers who will have a sales role.

3 The "push" strategy involves using the sales force and the distribution network to actively promote the product right up to the final client.

4 The "pull" strategy involves a massive investment in publicity in order to develop a preference for the brand amongst the clients.

Fig. 4. The complete value network



This step by step modelling (backbone, actors of the value chain, economic flow and image flow) allows us to accompany the on-going thoughts of the work group. In this case, the group members considered that doing the mapping in this way provided a useful support to collective strategic analysis.

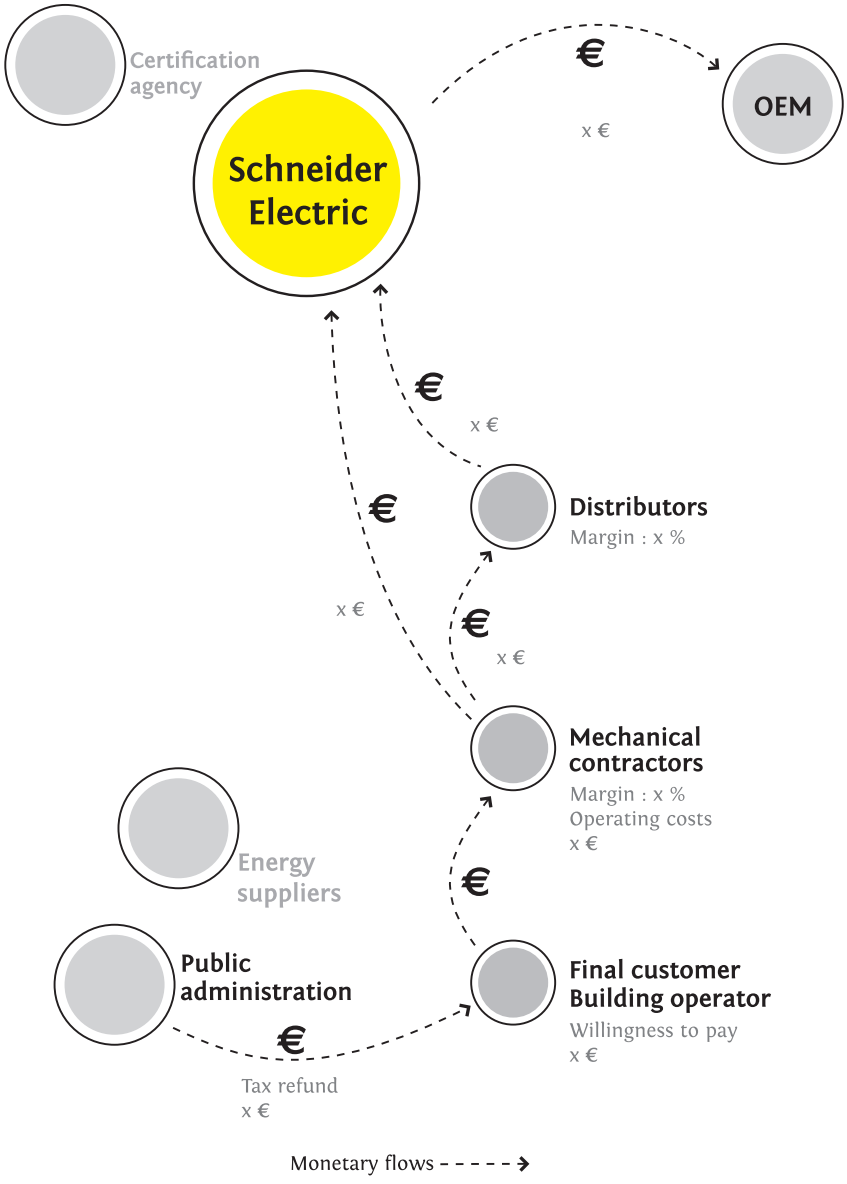
Also, as we will see, these graphics representations are useful as a basis in producing economic hypothesis and provide a first level evaluation of the economic viability of the business model being explored.

Evaluate the value capture potential

At this stage, the data available remains very qualitative and doesn't allow for precise financial projections. The idea is not therefore to define a highly precise business plan, but rather to provide elements that suffice to give a good idea of the capacity that the company would have to capture enough value.

The work carried out here by the group involved taking each of the financial flows on the value network and then formulating hypotheses. These hypotheses are developed at three levels: the mechanisms of value creation, value sharing and value capture by the company. This logic of value creation and distribution between the actors of the network is firstly modelled based on a potential contract (Fig. 5). The hypotheses of accessible market size are then added. At this stage a model was developed on a spread sheet. These tools allowed simulations to be carried out and hence to refine the hypotheses during the work group's meetings.

Fig. 5. Illustration of financial transactions with corresponding hypothesis[5]



5 For reasons of confidentiality we are unable to provide the financial data actually obtained in this real case.

2.4. Mechanisms of value generation

As indicated above, the first stage involves reasoning along the lines of one sole contract. This enables us to evaluate the readiness, or not, of the targeted clients to pay. This information is often difficult to obtain but it is important to have an idea of the value created to then be able to share it over the network. In the case of Calorie, the value potential was evaluated by questioning several potential clients who indicated that they'd be ready to pay a price that corresponded to a two to three year return on investment. Moreover, in some countries such as France, the clients can obtain tax rebates. This enabled us to define a first hypothesis that clients might be willing to pay more than the amount stated. Once having obtained the "how much" the clients were willing to pay, we imagined "how" they would pay, in other words the revenue generation model. The work group studied a number of options from classical full payment up front to payment on use. In the energy efficiency sector, it can even be imagined that the company be paid in proportion to the savings made. This is known in technical jargon, as "performance contracting ". In the present case, this solution was not retained by the work group who chose the classical solution of payment to order up front. The fact that the group went through this analysis on different payment approaches will however enable the group to adapt the business model more easily in the future if they choose to.

2.5. Mechanisms of value sharing

This section concerns identifying how the value created for the final client is shared amongst the intermediaries in the network. The group defined a number of hypotheses on the costs incurred by the actors contributing to the delivery of the value proposition. For example it was estimated that the installation of the device on HVAC machines would require two days' work for the installer. The model then takes into account the normal remuneration and practices in the targeted sector, typically the installers' margins in addition to those of the distributors for this type of equipment. These margins must on the higher side ~~to~~ ensure that the actors concerned be motivated to provide this type of service rather than others. Finally as we saw above, some actors possess assets that are essential for the deployment of the model. In this case, for example, the machine manufacturers must provide the technical information required to define the parameters of the Calorie solution. The access to this information is considered a critical point. It will therefore require delicate negotiations with the manufacturers.

Moreover, it is to be noted that the problems treated didn't lead us to study the relations with the actors who are further upstream in the value network. This was largely due to the fact that the industrialisation of the products would go through the group's standard processes and hence was of no interest for this case.

2.6. Value capture mechanisms

Finally the model must highlight the financial flows that pay the company directly. In the Calorie case, two sources of finance were identified: those that come from the sale of equipment (the control box) and those resulting from the sale of software. The value sharing mechanisms identified above allow us to define how value could be shared between equipment and software so that it is as favourable as possible for the company whilst still being acceptable for the other actors in the network.

This modelling step precedes the formalisation of the business plans. It is an intermediate step between the business model and the business plan and is little treated in literature on innovation or entrepreneurship. However, this step is critical as it prepares the more detailed work that comes after on the volume hypotheses, the more precise calculation of internal costs and hence the more detailed calculation of margins. The calculations carried out are sufficient for the company at this stage. In addition, this type of modelling allows the group to share the hypotheses that will be the basis of collective analysis and discussion.

3- Conclusion

We've illustrated through this chapter, the interest in using modelling tools to develop business model prototypes during the exploration phase. The approach presented is in four phases: the definition of a value proposition, the storytelling of the value proposition, the mapping of the value network, the development of a financial simulation tool. The prototyping of the business model prepares both for work on the business plan but also the concrete action plan, notably thanks to the modelling of the value network on several levels. The first interactions between the project manager and the various deciders or internal sponsors show that the models generated greatly facilitate the understanding of the concept and the Business Models that could be used to create value from it. The debate and the questions brought up by the project and different levels, which came either from within the project team, or more broadly within the company, allowed the orthodox attitudes to the dominant Business Models within the company to be questioned. This type of approach structures collective analysis within a work group and improves knowledge sharing. It also enables a shared vision to be built which helps prepare the future of the business. This, in our mind, appears to contribute to the creation of areas of strategic analysis at an operational level which is vital in ensuring the successful implementation of the group's new vision. In this way, by developing this type of Business Model prototype, the innovation teams become, in a sense, strategy laboratories. In other terms they become a place where the strategic vision can be tested and experimented on real innovation cases.

CREATING MORE VALUE THROUGH THE INTEGRATION OF BUSINESS MODELS IN E-MARKETING

Predictys: a transformation from infomediary to integrated web-agency

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The market for online advertising is very competitive and is characterized by an increasing concentration and the presence of large and very strong players. To become a player in this market means developing a niche activity with a package of innovative services built on innovative technology. This is the challenge that Predictys attempted, moving from a classic infomediary business model, it has expanded its offering to become an integrated web agency. It has sought to develop an offer for the management of marketing campaigns coupled with the enhancement and monetization of Internet user profile data bases.

Introduction

Online advertising, despite its recent arrival in the advertising world, is creating a revolution in the sector. The main actors in the sector didn't get it wrong. They've launched takeovers, each more spectacular than the previous: taking control of the RightMedia network by Yahoo for 680 million dollars, of Aquantive by Microsoft for 6 billion dollars or the DoubleClick network (70% of online advertising in the United State) by Google for 3.1 billion dollars. The tendency of e-advertising has moved towards the regrouping of online advertising networks which implies that these networks to be able to broaden their capacity to follow and collect information on Internet users (Peyrat, 2009).

Online advertising has traditionally been divided into seven categories: the "search" (purchase of key words), the display (publicity banners), the address data bases (selling of e-mail addresses), the affiliation (presence of a marketing site on one or several screens of affiliated sites), the price comparators, e-mailing and the mobile phones.

It's the e-mailing activity that Predictys chose to enter the market in 2007. Initially the company decided to limit its activity to the French market, positioning itself as an editor.

This chapter explains how Predictys has developed since 2007 up until today and how the company found an original position on this market, already saturated and dominated by a number of large actors. We'll explain the two main development phases of the company: the first over which the company adopted the position of a traditional actor in the online advertising market, and the second where Predictys attempted to differentiate its services from those of its competitors through producing more detailed knowledge of Internet users and their behaviour.

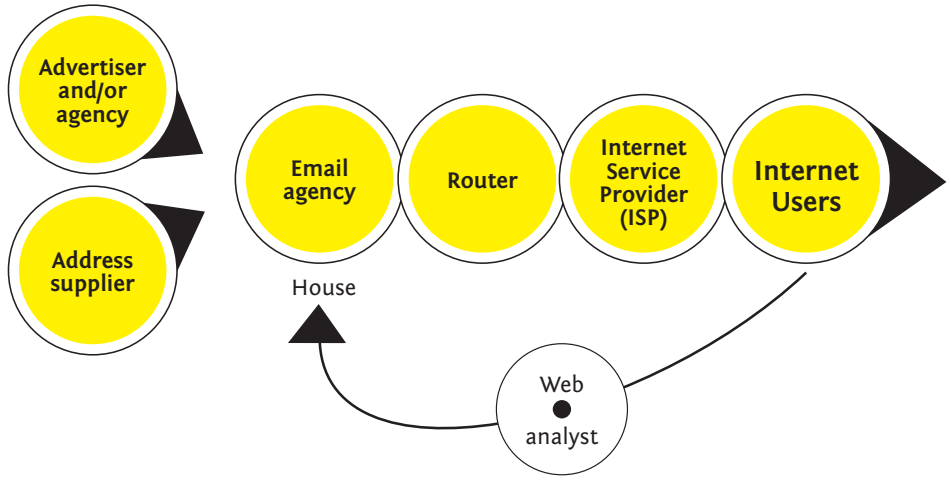
1. Predictys: a new actor in the French e-mailing market

E-mailing is far from being the most attractive of the online advertising segments. In 2009, it represented only 52 million euros against 240 million euros for the online displaying of adverts. In addition, from 2007, "Le Journal du Net" (A French e-journal providing data and analysis on Internet and e-business uses and trends) indicated a downward trend in the performance of this media (reduction in new connections, increase in subscription cancellations, etc.) and announced that the market had reached its maturity phase. However, despite the downward trends in 2008 and 2009, in 2010 e-mailing reversed the trend and started a marked upturn.

When an e-mailing campaign is carried out when an advertiser decides to send a mailed advert via the Internet to targeted Internet users, the value chain is as follows:

Web analysts record the behaviour of the users on receiving the e-mails (clicks, openings, etc.) and sends them to the email agency.

Fig. 1: Actors involved in the implementation of an e-mailing campaign



The advertiser or his Web comunication agency creates the message. The message is then transmitted to the email agency, along with the objectives of the campaign and the details of the targets. The email agency obtains the e-mail addresses of Internet users' corresponding to the target from their suppliers. These are then sent to one or several routers who send the e-mails to the Internet users via the Internet Service Providers (ISP).

The success of a campaign depends on several factors, of which the most important are:

- The pertinence of the message, or the capacity of the message to provoke the curiosity of the targets
- The quality of the addresses,
- The capacity to overcome the obstacles set-up by the ISPs to protect their clients

The major actors of the e-mailing market

Amongst the many opportunities that exist to generate revenue on the Web (Rapp, 2006), notably on the emailing market, selling information on market targets is one which has undergone very fast growth over the past few years. This service is supplied by "infomediaries" (Deephouse and Heugens, 2008). Their role is to supply information to their clients on the (existing and potential) consumers of their clients' products and services, information that they themselves are incapable of collecting. This type of intermediary collects and analyses information of the purchasing behaviour of Internet users, which they sell in turn to companies who want to better understand the behaviour and purchasing habits of their cyber-clients. An infomediary can also, for very specific targets, end up building consumer communities. In this way, as a compliment to the direct interaction that companies can have with their clients, the infomediary can constitute very complete data bases that can allow their clients to obtain a much more detailed understanding of the purchasing decision making process of consumers.
From the outset, Predictys positioned itself on the online advertising market with an infomediary Business Model. We'll describe this position by going over the main elements of its Business Model.

1.1. A traditional value proposition for an e-mailing service provider

Predictys first developed to provide services corresponding to those of a traditional dedicated emailing* service provider. This activity was in turn divided into two complementary activities:

- An *e-mailing agency* activity which e-mails adverts for its customers to their clients and potential clients. The service offer involves sending mails from opt in* data bases supplied by the advertiser or bought from suppliers.
- A *monetizer* activity whose aim is to add value to seller data bases. Here the service offer consists in adding value by improving the quality of the customer data bases (i.e. through the suppression of IASPs* and by improving personal data).

1.2. The resources and competencies used

At the heart of the creation of Predictys was the idea of creating an editorial platform. This integrated platform made up of a software environment and technical infrastructure, is designed to support both company's business.
Based on the fact that, from a technical point of view, there is no major difference between the routing of a marketing e-mail or a newsletter, the publishing platform was designed to support a variety of types of messages and distribution channels (web, mobile, etc.).
Over and above the delivery of content (e-mail, newsletter, etc.), the platform was designed to enable the data bases to be enhanced and improved and so provides value. To this effect it includes:

- Performance indicators (statistics on the numbers of clicks, window openings, delivery rates…), which provide indications to the impact of the messages.
- A qualification procedure for content to be disseminated, in other words content is evaluated according to a set of criteria in order to be able to analyse which messages have the most impact (main subject, writing style, hoped for impact on the reader, etc.),
- The identification of targets for content on the basis of targeting criteria which enable the targets to be identified on whom the content is likely to have the most impact.

It is therefore a highly tangible resource, in the meaning of Grant (2005), which was developed by the company to support its strategic development.

1.3. The position of Predictys in the in the business advertising network

Predictys is specializing in the distribution of content.
Predictys does not play any role (so far) in the creation of advertising contents, as the company receives the creation kits from either advertisers or their creative/web agencies.
However, Predictys creates editorial content for its own journal and site: manews.com.
Predictys manages a big consumer data base, composed of opt-in email addresses coming from other commercial sites. These sites subcontract to the company the sending of publicity messages to their opt-in members. In return, they receive from Predictys a part of the generated revenues.

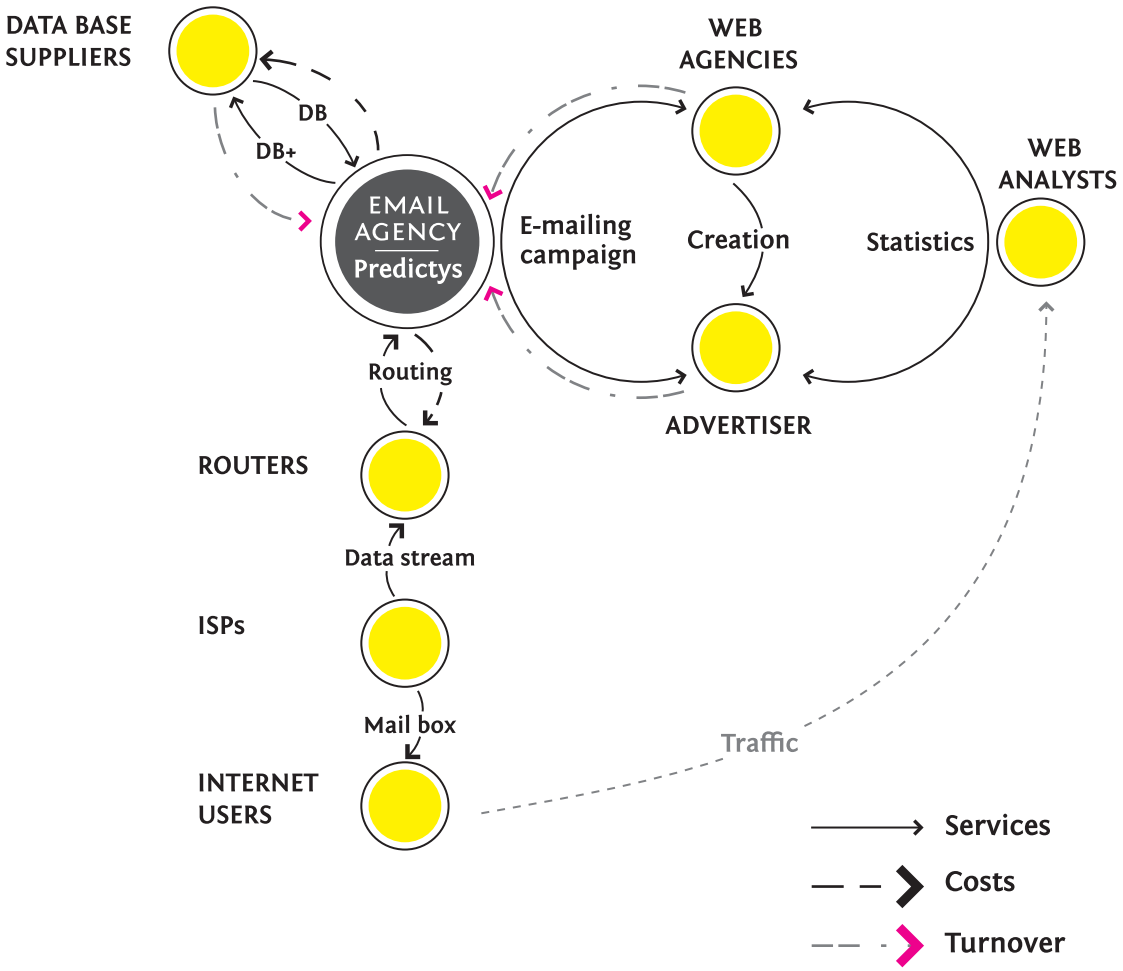


Fig. 2: The position of Predictys in the e-mailing value network

In the distribution of messages to Internet users, Predictys depends on two market players that are difficult to circumvent: routers and Internet service providers (ISPs). Due to their regular activity with the ISPs, the routers are key actors in the distribution of e-mails. Their experience and knowledge of distribution mechanisms means that they can guaranty a high level of delivery, notably through use of their knowledge of the ISPs' filtering techniques.
The position of Predictys in the publicity e-mailing value chain remains limited; the added value proposed is being mainly based on the quantity and the quality of the contact data bases managed by the company.

1.4. The revue generation model

In this first model, Predictys obtains payment from the various content suppliers for whom the company distributes publicity messages (cf. figure 4). Therefore, only the e-mailing agency's e-mailing activities and those of *monetizer** generate revenue.
As an e-mailing agency, the revenue model is typical of Web 2.0 compensation models. Predictys is not paid according to the service provided but rather according to the results obtained. This model, known as a performance based revenue generation model, is made possible by the natural propensity of the web to produce traces and quantitative data which makes numerous metrics possible.
It is possible to measure all the responses of targeted Internet users, through web analysts. For example, if an advertiser chooses to invest in a poster campaign by posting adverts on several websites, he can know precisely the number of times that his flyer has been seen, site by site. If he opts for an e-mailing campaign, in less than 72 hours, he will have an estimation of the number of people who have

received the message, of those who have opened it and those who have read it.

Predictys' revenue therefore depends on its ability to identify the actions carried out by the targeted Internet users. For example, the number of clicks (CPC)[1], or more complex actions such as filling forms, taking out a subscription, a purchase, etc. (CPA)[2].

1 CPC: Cost Per Click

2 CPA: Cost Per Action

The payment lead-time may be longer or shorter depending on the number of actors involved in a communication campaign, each intermediary being paid along the way. It is essential to integrate as many services as possible and to intervene as close as possible to the advertiser's in order to obtain quicker payments and secure higher margins.

The monetization of databases is based on the same performance model. Predictys pays database suppliers a percentage of its remuneration. The amount paid reflects the central role of the database owners that provide the precious email addresses. This is also explained by the fact that the direct recruitment of a user represents a high cost: €0.5 to €1 per Internet user.

This performance based mode of payment influences the way that risk is distributed across the various actors involved. In this case, the interests of the suppliers of content (the advertisers) are guaranteed, whereas Predictys supports the risk in the event of worse than expected performance. It's Predictys that engages the resources required, and pays the associated costs, without knowing how much the company will be paid. The company's income generation is therefore uncertain which weakens its economic model.

1.5. The necessity to differentiate the offer by integrating content edition

From the outset, the company was aware of the inherent limitations of their model, which was not very differentiating. Very quickly an ambitious R & D project was set-up to develop an innovative content editor activity. Based on the creation and dissemination of its own newsletter, "MaNews", the company has primarily sought to learn the craft of custom-editorial-content-creator and to understand how to use the newsletter to create strong long term links with Internet users.

This second activity, whose development began over the first development phase of the company, involves the formatting and dissemination of information content. It was mainly an opportunity to develop a narrowcasting editorial platform with highly developed and personalized editorial content. For this, Predictys "learned as they walked" or, in other words, "MaNews" was actually offered to the market, with real time adaptation and development of content.

A newsletter aims to retain users who subscribe. This loyalty is possible only if the user gets real satisfaction out of receiving and reading the newsletter. This is obtained through a balance between the interest of the content and the customer benefits provided (gaming, discount coupons, tips, etc.).

A newsletter is built around several elements: a content, an editorial chart and a graphics chart. Each can be sub-contracted according to objectives and delivery frequency.

To generate value through the publication, the publisher may sell part of the editorial space to web agencies managing an affiliation network. Finally, in order to extend the audience of its newsletter, the publisher can develop co-registration agreements (common subscriptions) with advertisers who are publishers themselves.

The publishing service provided by Predictys involves sending a newsletter to targets on behalf of an advertiser, the latter being, for example, a company who wants to provide regular information to clients. Companies who subscribe therefore don't have the constraints of regularly having to produce editorial content whilst remaining clearly identified as being at the origin of the newsletter. In this value network (Fig. 3), Predictys plays the role of both producer of its own newsletter ("MaNews") and producer capable of housing the management and distribution of newsletters.

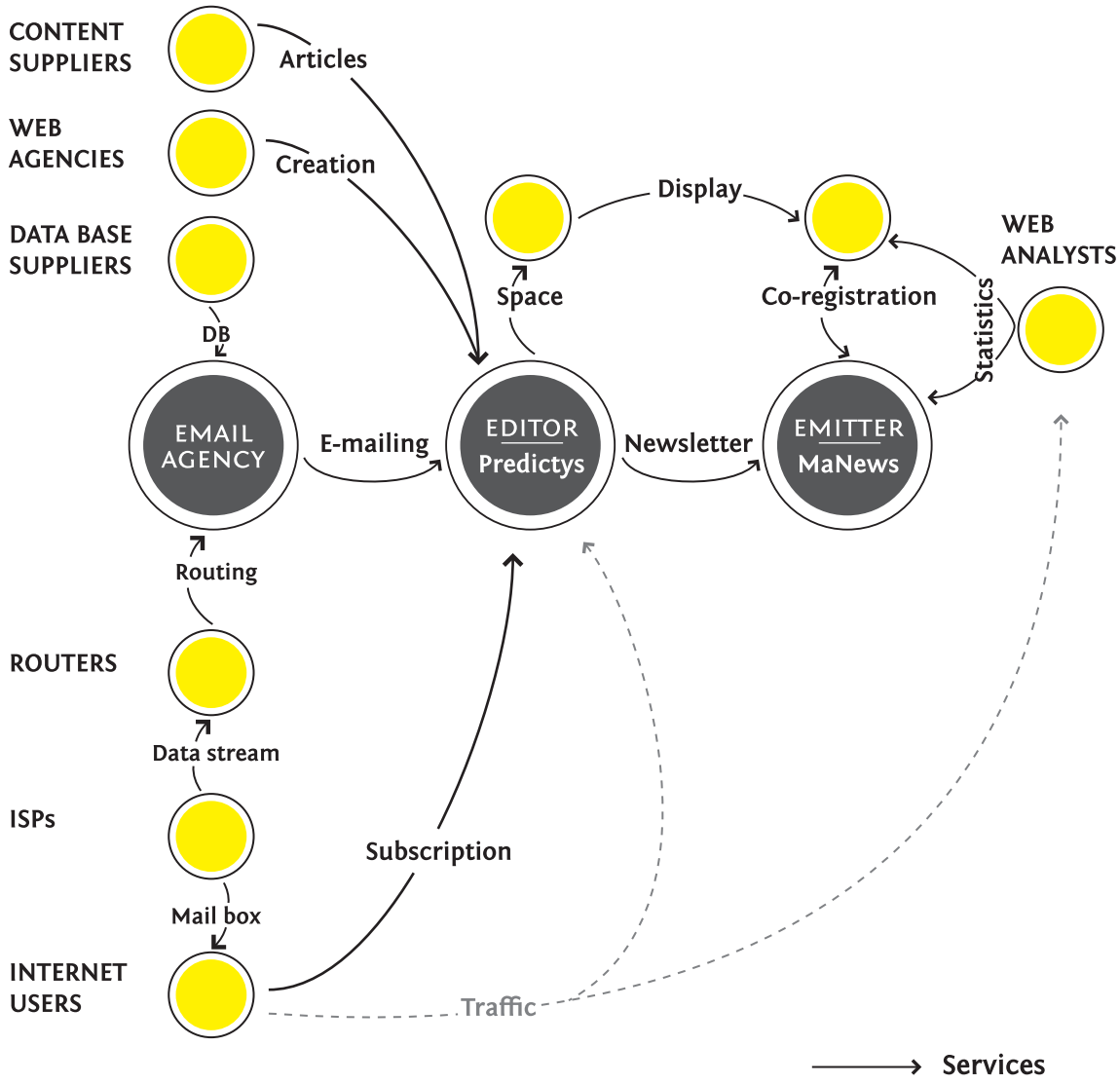


Fig. 3: Position of Predictys in the Newsletter value network

It's worth noting that one of the specificities of the "MaNews" newsletter is that it's possible for the Internet user to personalise the newsletter. In other words, subscribers can choose the content and form of the articles that they receive. When they register, they can choose themes that interest them, from a list of themes which go from "news" to "travelling" going through such things as "finance" and "celebrities". Having made their initial choice they can change it at any moment.

In this first development phase, the editor activity didn't generate any revenue for Predictys. It was above all an investment in an activity that would generate detailed and precise knowledge of Internet users that would improve the value of the company's second Business Model.
In this way, Predictys simultaneously developed two dissociated activities with different objectives, as illustrated in Fig. 4. These two activities will start developing synergies in the second development phase of the company.

Fig.4: Predictys in its first development phase

2. The second development phase of Predictys: differentiation through an (Online) e-mailing agency Business Model

2.1. The evolution phases of Predictys

Over the first two years of its existence, Predictys acquired a double competency: that of better knowing and understanding its market and improved efficiency of its e-mailing agency and editing activities. Following two difficult years, in 2008 and 2009, the online advertising market started growing again in 2010. According to Predictys' analysis this was due to two main factors:

- Technologically, the actors are planning to maintain their investments in 2011 while turning to richer media such as video, and to leveraging Web 2.0 social networks or even mobile phones.
- E-mailing campaigns have undergone a steady decline in performance (lower open, click and reaction rates). Several factors explain this phenomenon, including: lassitude of Internet users faced with intrusive pop-ups and overloaded mailboxes, more stringent filters implemented by ISPs[3] to limit the "undesirable" mails and ineffective targeting of mailing campaigns.

These two factors gave Predictys the impression that there were two movements underway. The first involved the broadening of the e-mailing agency service offerings to include the new expectation of advertisers and the second was that it became obligatory to use qualified data bases on Internet users i.e. qualified data refers to the wealth and precision of information contained, which allows for much more precise targeting.

Predictys had learned a lot from its work as editor of the "MaNews" newsletter. Not only had this activity enabled the company to acquire competencies in the activities of publishing and distributing content, but also to considerable information on the market of customising content.

The web publishing activity brought to light an interesting opportunity. This opportunity came from being able to qualify the content of a message by using metadata and collecting the reactions of Internet users to these controlled messages. In this way it would be possible to identify and differentiate between users and by so, over time, be able to identify Internet users interested in, for example, the celebrity section and those who prefer the gardening section.

3 This is accentuated by the fact that the ISPs capture very little value from the services they provide. Some figures suggest that they were attempting to capture more value. Creating bottlenecks (reduction in volume, filtering according to IASPs, etc.) all in the name of user quality of service, puts ISPs in a strong negotiating position for upcoming negotiations.

In this way, the regular sending of information becomes an opportunity to improve the knowledge of each individual Internet user.
Finally, the infomediary activity enabled the company to enter the market as an e-mailing agency and e-mailing monetizer, and hence:

- Develop the editorial platform and operate it on an industrial scale.
  Table 1 below illustrates the platform and its capacities,
- Test the major features of the platform on large scale operations
  and stabilize technical know-how;
- Improve knowledge of all the other actors and how they interact
- Increase competency in the enrichment process of data on Internet users.

Despite this, difficulties subsist which are mainly related to the Internet users behaviour. The company encountered two difficulties:

- Proposing customization for individual profiles is very difficult especially when the public is highly heterogeneous and the targeted population large, because it involves using of a very broad variety of subjects
- Even if the newsletters' readers have the opportunity to personalise their content, they tend not to, as they behave as mass consumers, who read, or don't read, what's proposed.

Based on this statement of fact and the company's acquired competencies, Predictys decided to move into a higher added value segment whilst continuing to differentiate itself from existing market offerings. The company therefore changed its Business Model.

2.2 A new value proposition based on offer enhancement

Predictys, building on its two existing independent activities, those of e-mailing agency and Publisher, created a new offer based on three coordinated activities: Web agency, value enhancer and editor. Web agency business is an extension of the activity of e-mailing, through proposing multi-channel campaigns* on the web. The objective of the value enhancer activity is to produce individual and personal knowledge on Internet users.

Table 1: The complementary roles of Predictys

	RÔLES	
	Agency (1)	Value Enhancer (2)
Concept	Manage publicity campaigns	Enhance the knowledge of individual clients
Value proposition	Optimise multichannel campaigns by targeting single interlocutors	Provide detailed qualification of the behaviour, attitudes, practices and values of Internet users
Clients	Advertisers Agencies	Trading companies (owners of the sites)

The innovative aspect of the agency's role lies in the ability to offer the complete management of optimized multichannel campaigns. In addition to creating content, the company plans the campaign and assesses the impact of an action on the overall result and if necessary, makes any necessary changes. Predictys's clients can therefore be sure in the knowledge that their advertising campaigns will be more efficient.

The role of enhancer involves collecting additional personal data to improve the quality of contact databases and to propose more efficient targeting based on detailed characterization of behaviour, attitudes, practices and values of individual Internet users. This, for Predictys, is a key role in its second phase of development.

The challenge is to be able to build an understanding of individual Internet users based on the multiple and varied sources information i.e. the traces they leave on the web. Predictys, in constant interaction with the Internet users, aims to make sense of information that initially has none. The company's job is to formulate what the surfers are (or what they could be) in order to provide their customers with a deeper and more precise understanding of their own customers and their situations (personal, economic, etc.).

The competency of database enhancement supports the "Agency" value proposition. The data characterization skills acquired as an agency provide the natural outlet as an operational data enhancer, notably by allowing for more effective routing. So there is considerable synergy between the roles of agency and data enhancers.

Predictys is still, however, dependent on other players who can provide databases. To reduce this dependence and the associated risks, Predictys sought to develop and enhance its own database. Based on the knowledge and experience acquired as a content publisher (development stage 1), the company intensified its editorial work via its "MaNews" newsletter to reinforce existing links with users and also to create new ones. The company therefore acquired a client loyalty tool, an essential tool to develop its role of database enhancer.

The objective of Predictys is to move progressively from the generally understood role of infomediary to that defined by Sawhney et al (2003). Rather than collecting factual information on, for example, the purchasing process of online shoppers, this type of company attempts to aggregate customer information in order to be able to obtain a more detailed understanding of them. In this way, by capturing and analysing the different ways in which the emails sent are consulted, it is possible to determine the organization and rhythms of the users' lives.

Thus, Predictys will attempt to develop its customer knowledge as long as the relationship last and at with each client interaction. The stakes of this customer knowledge concern both the individualization of knowledge and on the identification of spontaneous communities of customers (cluster) with similar characteristics.

The aim is to target its mailings and perform segmentation compatible with operational issues of routing and with economic and marketing issues.

2.3. The development of new technological resources

The technological challenge is now to allow the dissemination of highly individualized and personalized content and the organization and monitoring of closely targeted information campaigns. To reach this goal knowledge must be acquired on the individual that goes above and beyond the personal and factual information that make up conventional customers databases.

Technological resources: advanced engineering.

Implementing a system which can detail the characteristics of user behaviour implies designing a sophisticated system capable of managing the history of interactions with individual users. The system must be able to dynamically interpret users' actions and must therefore have a very short processing time. Indeed, the processing time for data collected after an action must be coherent with the carrying-out of the next action, if not the system bottlenecks and the targeting data is no longer valid.

In this context, the performance of the system is the volume of activity that the platform can maintain.
The following diagram illustrates the functional logic of the platform. The platform is positioned at the convergence of three data streams: Internet users addresses, their expectations and the information content to be transmitted.

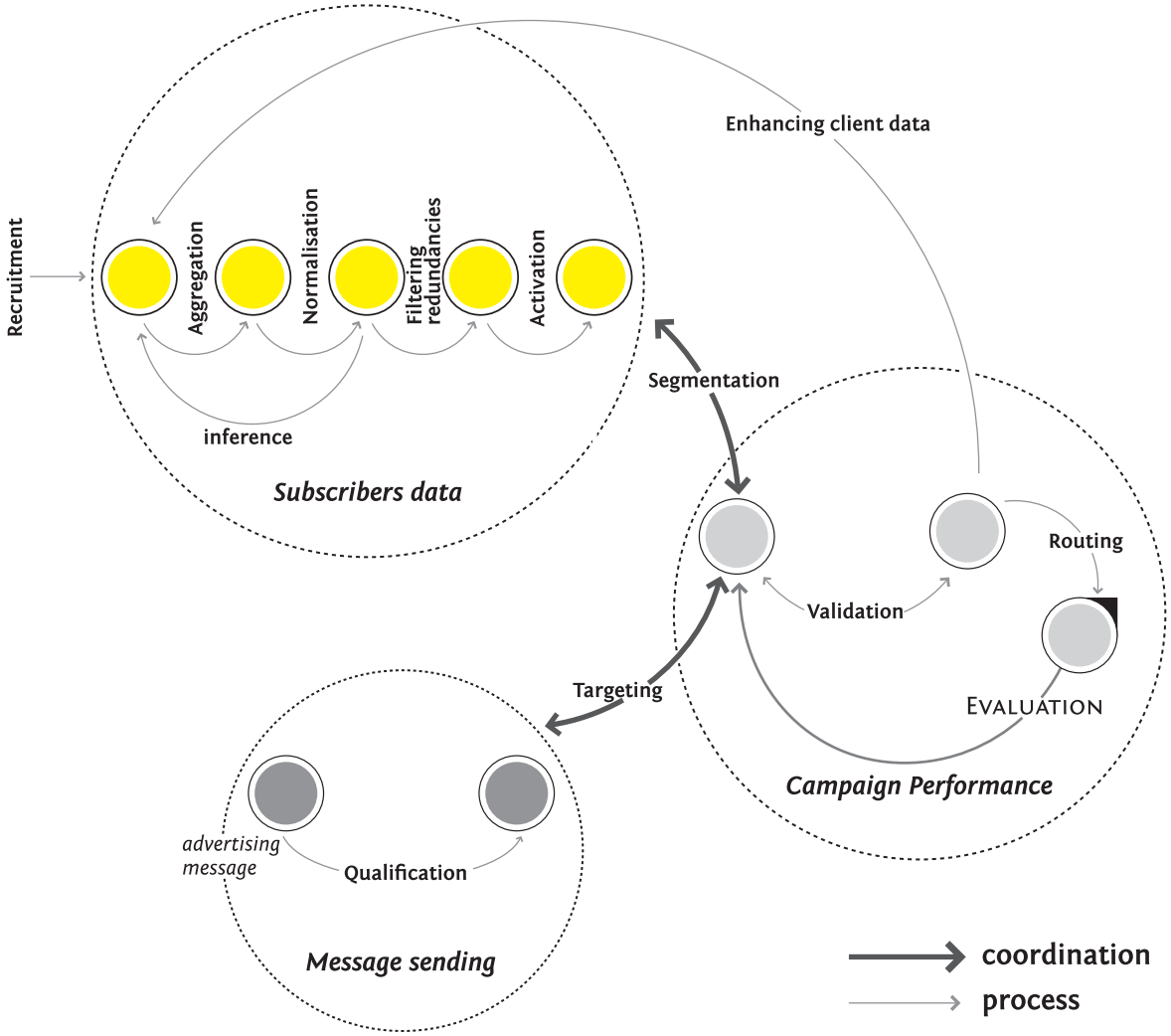


Fig. 5: Functional outline of the platform

Whether from the advertiser (or his agent) or content providers, content is qualified according to the content subject, style of writing, formatting, etc. The qualification process and qualifying meta-data is a strategic resource for the company.
The content is then sent to users, whose reactions (opens, clicks, etc.) are collected for two purposes: to assess campaign performance and improve the knowledge of the Internet user. Indeed, the content being qualified, the recorded activity of the Internet user allows their behaviour to be formalised and to identify what makes them react and may be of interest to them. This individual information will enhance the database on the Internet users themselves enabling Predictys, over time, to offer its clients (advertisers) very precisely targeted marketing campaigns or editorial micro-targeted.

Research and Development: an empirical approach

The personalisation of the knowledge of Internet users raises three major technological challenges that Predictys sought to respond to through R & D. The first concerns the development and implementation of a model capable of acquiring information about Internet users. The second concerns the capacity of the platform

to manage and treat large amounts of data. Finally, the third involves the capacity to be able to develop operational models on how to use the knowledge about Internet users.
Answering these three technological challenges involves mobilising knowledge and expertise in a number of different areas (marketing, sociology, information science, computer science). The development process can therefore only be empirical i.e. derived from experiment and observation and gradually evolving with experience.
Predictys benefitted from this empirical approach by acquiring specialist expertise not readily transferable and nor imitable by competitors. Predictys, therefore, aims to develop competitive advantage by building intangible resources: the creation of a customer-knowledge-refinement model.

2.4 Evolution of Predictys' position in the e-mailing value network

These new services along with their associated competencies enable Predictys to modify its position and role in the value network. The company from this point carries out the roles of several network actors (router, e-mailing agency, publisher, web analyst) which enable the company to capture more of the value it creates but also gives it more control over its brand image and legitimacy as a new market player. In the upstream part of its activities Predictys now organises a service offer in the creation of content and the strategic management of advertising campaigns. Downstream, Predictys integrates the functions of router and analyst for itself. In this way Predictys controls a larger part of the e-mailing chain which in itself is a non-negligible advantage for its clients: the advertisers and distributers of editorial content.

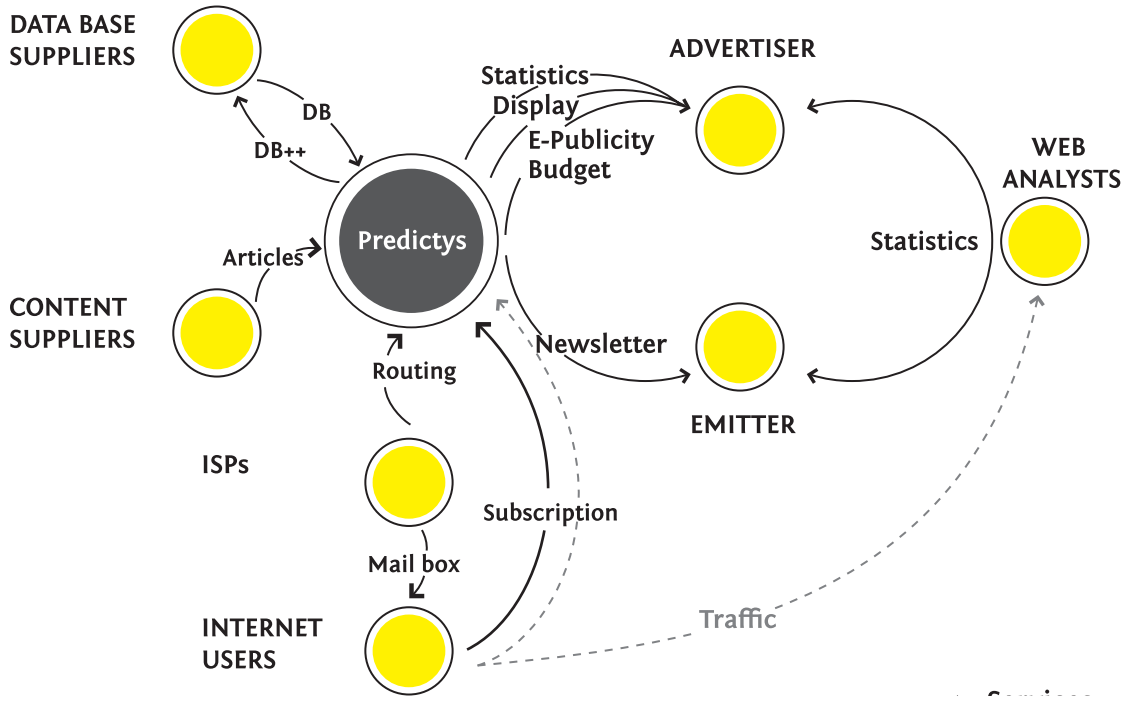


Fig. 6: Evolution of the position of Predictys in the e-mailing value network

The integration of the various roles involved in marketing campaigns gives Predictys more control over the information necessary (both in volume and quality) to better characterize the Internet users. This gives Predictys the opportunity to adopt a new strategic position. It also allows the company to respond to new market needs: the personalisation and customer relationship management and loyalty. This new situation should allow them to acquire a distinctive competitive advantage over their competitors.

2.5. Revenue generation

This new development phase allows Predictys to generate additional income from on one side the organization and optimization of multichannel campaigns for advertisers and on the other through the enhancement of customer databases as illustrated in Figure 7 below.

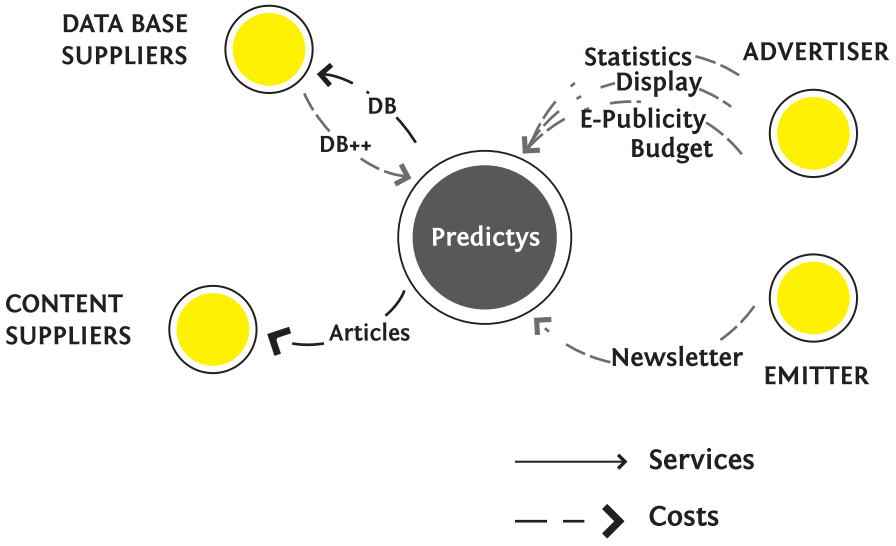


Fig. 7: The Predictys revenue model as a Web agency

These new cash flows are interesting for several reasons:

- They are more likely: Predictys offers its customers new services that the company can sell,
- They are more profitable: by expanding its role as an Agency Predictys decreases the number of intermediaries required to produce the proposed service and becomes a direct contact of advertisers. It thus becomes a major player in the value network and as such captures much of the value created, in other words the margin;
- They are faster: the lower number of intermediaries enables Predictys to shorten the time to payment.

Though this new compensation model does not reduce the risks facing Predictys' dependence on advertisers, it nevertheless generates diversified revenue streams that are both larger and faster.

Conclusion

Predictys has moved from a traditional intermediary role to a differentiating Business Model in line with the market tendencies in online advertising. The company has also evolved from an e-mailing agency and database Monetizer into the business of Web Agency and Database Enhancer. This has enabled the company to respond to the current requirements of a changing marketplace by providing services to manage multi-channel campaigns and above all customization, a truly differentiated activity. Both these activities are now linked with strong synergy between them in order to pursue the ultimate goal of Predictys to have a detailed knowledge of Internet users.

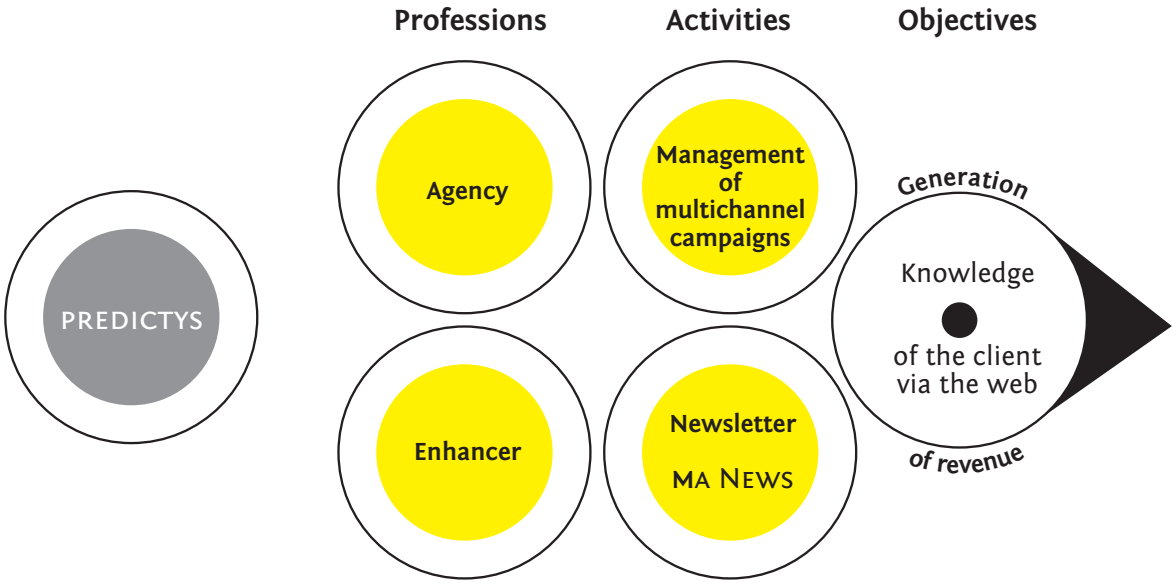


Fig. 8: Predictys in its second phase of development

Predictys a young company in the field of e-marketing, thanks to its learning process, has succeeded in developing a differentiating Business Model in line with the practices of actors in the domain of the web. Today Predictys is able to take into account three major trends of the market:

1 – Performance related revenue models are becoming more widespread:

Predictys derives its income from the results of advertising distributes and not the number of emails it's capable of sending. This model of performance related pay is only possible if you are able to evaluate the result of distributed messages through the use of reliable and incontestable metrics. Therefore, the challenge lies in the ability of the various Web actors, including infomediaries like Predictys, to develop tools for early assessment and for more and more sophisticated targeting, capable of accurately reporting the actual results of distributed messages.

2 - New questions about the personal data economy:

Numerical data associated with each Internet user is a prime challenge for the future of the digital economy. Possession of this data appears as magic solution which provides access to the intimate "needs" of consumers and a special relationship with them. The absence of heavy regulation in the sector and the incentive to over-exploit data as a result of the low cost of reproduction (Rochelandet, 2010) is the origin of numerous abuses resulting in several different reactions and proposition of several regulatory frameworks.

The first of these arises from the adaptation of the behaviour of Internet users who have considerably improved the organisation and the control of their personal data by multiplying their virtual identities in the form of ephemeral avatars. This marked tendency, even more marked in France than many countries, contributes to the increase in cost of collecting personal data.

The second part concerns the code of ethics defined by the direct marketing professionals themselves to guide their business. An example of this (in French) is to be found in the e-mailing charter (http://www.ufmd.org/). This framework, proposed in advance of statutory legislation, appears to be more on the restrictive side, which the professionals fear.

3 - The changing role of ISPs

On the Internet users' side, extensive use of the creation of spaces and private services (mailboxes, spam filters, etc.) can be seen and on the publishers' side, an overload of bandwidth and space storage. Faced with this reality, ISPs, key players, are becoming more demanding as regards the data exchanges, imposing a mode of operation that is increasingly restrictive for publishers. Thus the free routing may be poised to move to a paid model based on the volume involved. Faced with this reality the ISPs, who are key players in this arena, are becoming more demanding as far as data the circulating, is concerned, imposing ways of working that are increasingly restrictive for publishers. This leads to think that free routing may be poised to move over to a paying model based on data volume.

One might think that the system described will end up by regulating itself and that a more binding legal framework than the one that already exists is not necessary. Nevertheless, various legislative proposals are under consideration at European level. The principle of a tax on e-mail is no longer ruled out. In this event, the pre-selection of recipients will become vital.

Faced with these developments, Predictys, emblematic of the new *pure player*[4] actors, managed to find a position in e-marketing the value chain by capturing or developing a portion of the added value.

The company has made a bold gamble by resolutely committing itself to the qualification of databases and behavioural segmentation. They positioned themselves of a high added value intermediary in a market that now seems to be growing[5]. The case of Predictys shows that it is possible for a start-up to develop in a highly competitive market by using an innovative Business Model.

4 An term of American origin used to describe pure actors whose sole existence and activity is on the Web

5 See the statistics of the "Journal du net": 52% of advertisers foresee an increase, even a high increase, in e-mailing budgets. Also 52% of advertisers find this marketing lever more and more interesting in terms of return on investment.

Glossary

Advertiser:
The advertiser is the person or entity wishing to conduct a communication campaign. In web communication, the advertiser generally provides visual adverts that redirect traffic to its site (banners, interstitials, pop-ups, pop-unders.)

Affiliate network:
This is a network of intermediaries that linking advertising agencies or advertisers with website publishers to distribute content of adverts i.e. in the form of banners or e-mails.

Editor:
On the Web, the publisher is a person or entity who has a website and generates part of its revenues through the display of online adverts.

Dedicated email:
A dedicated e-mail corresponds to an e-mail promoting the product or service of one unique and clearly identified advertiser.

Internet Service Provider (ISP):
These companies provide a range of Web access services. In particular, it is the ISPs that manage IP addresses and email addresses and also provide storage space (including mailboxes).

Lead Generation:
Lead generation, a term that comes from marketing, covers all exploration activities that are implemented to "capture" new customers.

Monetizer:
A monetizer corresponds to a person or entity whose function is to organize the financial value of a customer database.

Multichannel:
Multichannel marketing campaigns use a number of different communication channels (email marketing, newsletter, display, off line media, etc.) to improve the impact on the consumer.

IASP:
"Doesn't live (or doesn't live any more) at the given address ..." This, by analogy with the postal service, corresponds to addresses that can't access email address boxes whatever the reason for the failure.

Opt-in:
Opt in e-mail is a term used when someone is given the option to actively accept to receive „bulk" e-mail, that is, e-mail that is sent to many people at the same time. Typically, this is some sort of mailing list, newsletter, or advertising. Obtaining permission before sending e-mail is critical because without it, the e-mail is Unsolicited Bulk Email, better known as spam.
A customer database is called opt-in if all the email addresses contained therein have the explicit consent of the owner to be used for a specific purpose.

Opt-out.
As opposed to opt-in, the opt-out approach involves emailing to addresses unless those targeted explicitly refuse to receive them. An email address is called opt-out if the owner does not explicitly refuse a request, usually sent via e-mail, to join a mailing list. The opt-out approach implies tacit agreement to receive and is illegal in France as well as in a number of other countries.

E-mailing agency:
(Online) E-mailing agencies are intermediaries between advertisers and publishers. The definition of their function is not very different from those who don't operate online the medium is the resource that makes the information available.

START-UP MID AND LONG TERM STRATEGIC MANAGEMENT USING A BUSINESS MODEL PORTFOLIO

PX Therapeutics and its dynamic approach to business modelling

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Tristan Rousselle (PX'Therapeutics)
Vincent Mangematin (Grenoble Ecole de Management)

The management of a portfolio of Business Models can help high technology SMEs make strategic decisions. This chapter highlights the use of methodology based on a portfolio of Business Models to ensure the medium term development of a company and its long term development, using a balanced grid of Business Models. The case used to illustrate the approach shows how PX'Therapeutics, a French biotechnology company, built its strategy and translated it into its portfolio of Business Models. This grid positions the level of promise and the level of risk for each Business Model. The latter, represented graphically, enable a manager to show the balance of the portfolio.

INTRODUCTION

Small and medium companies in the high technology area are often confronted with a number of specific issues: risk levels in fast changing environments, large investment requirements, launching of R&D projects with uncertain outcomes, etc. Here tools used to assist in decision making, more specifically those related to the managing activity portfolios or programmes often show their limits. For example, a portfolio approach according to the Boston Consulting Group matrix is difficult to apply for a high technology SME; one of the limits of the BCG matrix is that it positions the company according to its market share as compared to the market leaders. However, comparing a microelectronic start-up to the giants of the semiconductor world limits the attraction of the market. Another example is the Arthur D. Little matrix whose drawbacks are that it's long to document and the subjectivity of evaluators can significantly impact results of analysis. All tools used for strategy development can be criticised, the main thing is to use those tools that are adapted to the context of the company. For a high technology SME, the tool proposed is easy to use, helps balance medium term turnover and long term R&D investments. A portfolio of Business Models is defined as the range of opportunities for a company to provide value to its clients whilst ensuring its medium term viability and long term development. This approach is illustrated by the example of PX'Therapeutics (which we will call PX). Initially PX was a start-up from spun-off from the Institute of Structural Biology in Grenoble (France). The company was created by Tristan Rousselle and Nicolas Mouz in 2000, and operates in the biopharmaceutical industry. We see in this chapter how PX created its portfolio of Business Models, first as a result of an initial analysis in 2004, and then in 2010.

The use of a portfolio of Business Models seeks to balance the level of promises made to stakeholders with the level of risk, for each Business Model, and at a company level, to ensure medium-term viability and long-term development. The level of promise here refers to the expected turnover. The risk level is more complex and takes into consideration risks related to interdependency between the company and other organisations, risks related to feasibility and technical implementation and risks related to financial investments. We also have to evaluate the impact of each criterion (low - medium - high) taking into consideration the characteristics

of the industry, as we'll see in the case of the biopharmaceutical industry. A balanced portfolio should over time associate Business Models with low or medium risk levels but with a medium level of promise for the medium term, and more risky but more promising Business Models for long term development.

1- The context of the biopharmaceutical industry

Biotechnologies[1] can have application in many areas such as health, agro-food, renewable energy, cosmetics, etc. In this chapter we concentrate mainly on the biopharmaceutical industry which is currently the main application area for biotechnologies. French biopharmaceutical companies had an annual turnover of around 45 billion Euros in 2007, of which 47% was exported[2]. This turnover has been continuously increasing over the past twenty years. In 2008, 107 new drugs derived from recombinant proteins and monoclonal antibodies were commercialised worldwide. 76% of the market for biotechnology companies is the United States against 16% in Europe, and 82% of R&D is carried out in the U.S. against 13% in Europe[3].

In the biopharmaceutical industry the highest level of promise is that of the blockbuster, in other words a drug that generates over a billion dollars of turnover for the company that markets it. For example drugs for diabetes guaranty this kind of turnover: the number of diabetics in the world is huge and growing continuously. Other drugs treat less common diseases and have an average level of promise. We also need to consider companies that offer services, or equipment, to other companies. They may have low to medium levels of promise (compared to that of a drug reaching the market).

1 The OECD defines biotechnologies as: *"The application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services."*

2 LEEM report, 2008, L'industrie du médicament en France, Réalités économiques 2007.

3 Source Ernst & Young for France Biotech, Panorama 2006-2007 de l'industrie des biotechnologies en France.

[!] The level of risk takes three criteria into account:

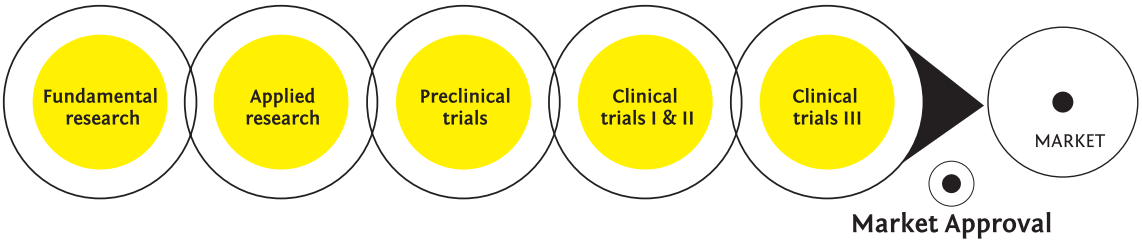
[!] **The level of interdependence.** When a company requires external competencies for its business model, it becomes interdependent to one extent or another. If the competencies are easy to acquire on the market, then the dependence is low; on the other hand if they are specific then the company will be closely linked to the partner that provides them and the dependence will be strong. In this case, keeping control over company's activities becomes more complex, as well as the capacity to capture value from the activity, which has to be shared with other actors.

[!] **The level of technical risk.** For a given drug the risk level increases with the dependency of the activity on the success of the drug. Drug candidates can fail at any stage in their development (see fig 1: the external value chain of the drug). In other words, a Business Model based on product discovery and development will have a higher technical risk, compared to a Business Model based on process optimisation.

[!] **The level of financial risk**. When a company has to invest in equipment, manufacturing plants, clinical testing, Intellectual Property Rights, etc., the resulting investment can be extremely high, increasing financial risks. In addition, the time between investment and return on investment can be very long indeed: the development of a new drug can require from ten to twelve years. This further increases the risk perceived by investors.

The development of new medication is done in five phases (Fig. 1): a therapeutic molecule is discovered through fundamental research, it's then studied in an applied research phase to become a drug candidate. The molecule is then tested on animals during preclinical trials. The phase I and II clinical trials involve testing on humans to adjust doses and detect eventual secondary effects. The phase is used to prove the effectiveness of the drug candidate on patients. At the end of this stage, the medication has to obtain an authorisation to be marketed provided for example by the Afssaps in France or the Food and Drug Administration in the United States. It takes from 12 to 15 years of development and tests to get from the fundamental research phase to a molecule being available on the market. In addition to the very long development lead-time, the investments are colossal; a new molecule costs on average 1.2 billion US$.

Fig. 1: External value chain for the medication



Companies today have three major types of activity (Figure 2) which correspond to several Business Models. Below we describe each of the Business Models that can be used to make up a portfolio with their graphic representation and a grid (Table 1) with the two analysis dimension: promise and risk levels.

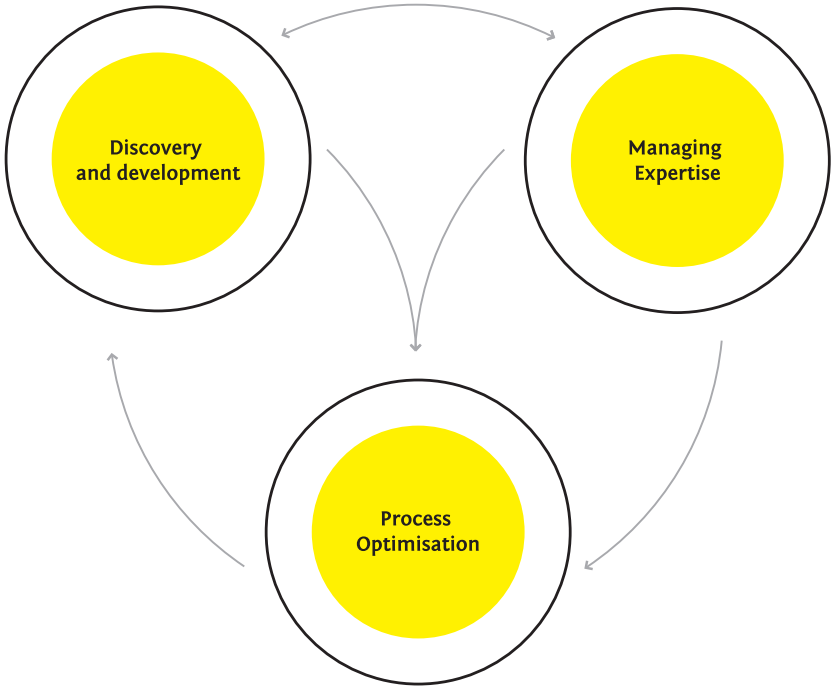


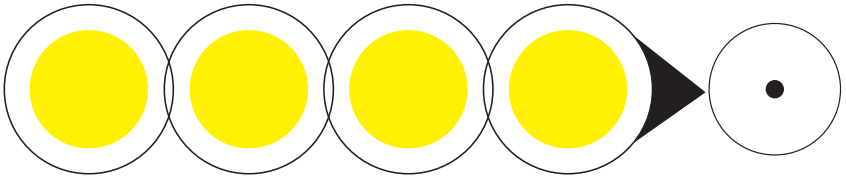
Figure 2: Three major types of activity

Main activity 1: discovery and development

Discovery and development of drugs constitutes the main activity of the industry. The Business Models based on development are generally perceived to be the most lucrative.

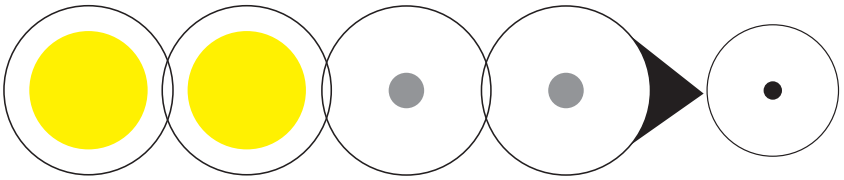
The total integration Business Model is a reference in that it's the best known and the most widespread. The company develops drug-candidates from research up to marketing the drug. The large companies that use this Business Model often set-up alliances with other companies, however, thanks to their size and control over the value chain, their level of dependency remains low.

Total Integration Business Model



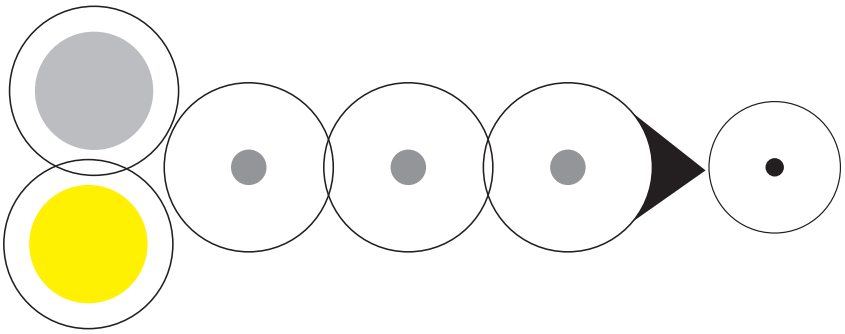
In the case of partial integration, companies carry out part of the development of the drug. For example, they could develop a molecule discovered internally up to the pre-clinical trial phase and then resell it to another company.

Partial Integration Business Model



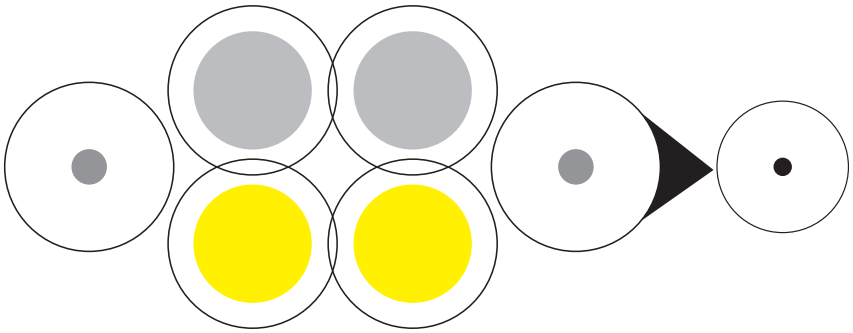
A considerable number of companies are organised to work in the "collaborate in the discovery phases" mode with other companies, or laboratories. The Business Model goes over the company's boundaries and needs to take into account the close collaboration with partners

Collaboration in Exploration Phases Business Model



The co-development Business Model is also based on collaboration but in this case over the development phases. Various forms of co-development are possible from development in parallel to the creation of a joint-venture between partner companies.

Co-Development Business Model

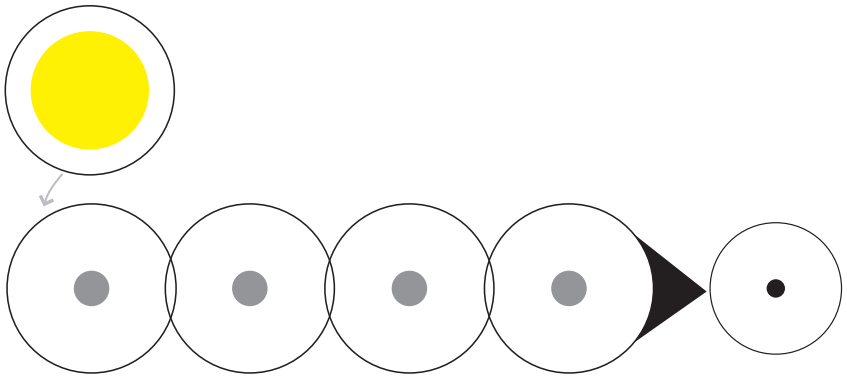


Main activity 2: Process optimisation

Process optimisation concerns all of the Business Models that focus on the improvement of one stage, or another, of the development process. As the market is a growth market, and the development of new drugs requires a considerable number

of different competencies, a considerable number of companies have chosen to specialise in one or more of the development phases.
The technological platform Business Model is based on providing high level services in research and development. This type of model proposes a high level of expertise at the beginning of the external value chain. Several types of technological platform exist i.e. open technology platforms, owner technical platforms etc., but they all have in common the fact that they provide the service of technology development based on specific expertise.

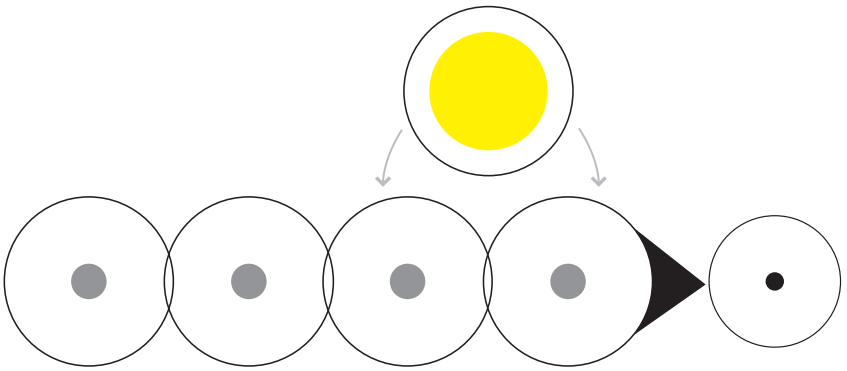
Technological Platform Business Model



The term CMO, for Contract Manufacturing Organisation, designates a Business Model aimed at producing preclinical or clinical batches or drugs. The production capacity for biotechnologies in France is largely insufficient in comparison with demand levels[4]. This Business Model requires production capacity conform to international standards and certified GMP (Good Manufacturing Practices), a certification which is obligatory in order to be classed a pharmaceutical establishment.

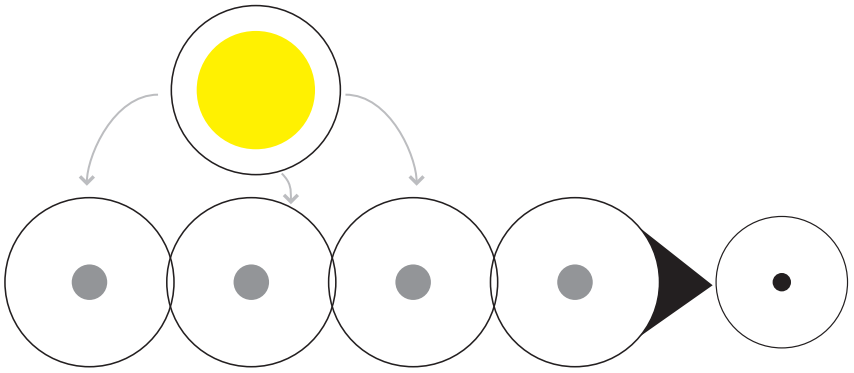
4 For more information see the report "Bioproduction en 2008, état des lieux et recommandations pour l'attractivité française", LEEM and the Génopôle, http://www.leem.org/dossier/101/etude-bioproduction-en-2008-etat-des-lieux-et-recommandations-pour-l-attractivite-1297.htm.

Contract Manufacturing Organization Business Model



The term CRO, *Contract Research Organizations,* refers to Business Models based on providing services in research but without production, and this is generally done at the beginning and the middle of the external value chain. For example, carrying out pre-clinical tests is part of the CRO services.

Contract Research Organization Business Model

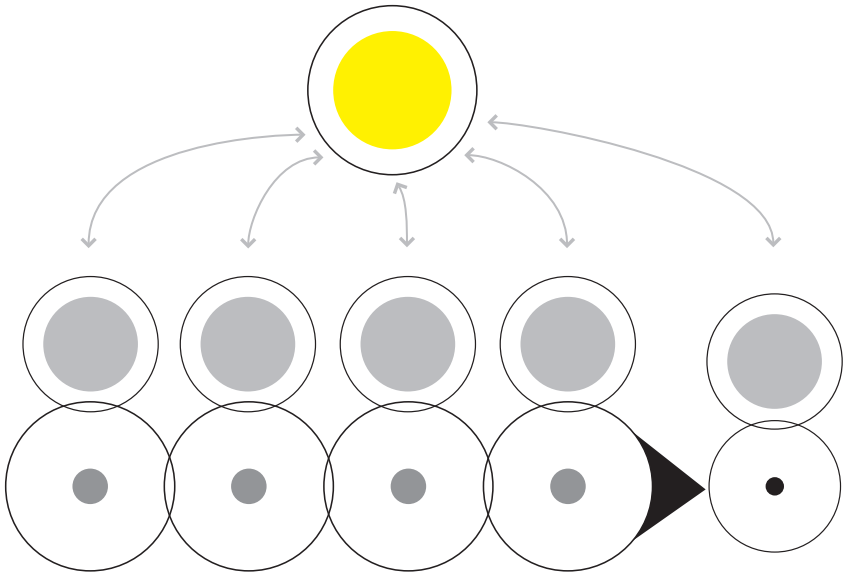


General Activity 3: Managing Expertise

Coordinating or combining know-how is the common denominator of the Business Models related to re-organising know-how, coordinating networks, leveraging or coordinating work with outside expertise. These companies create value by linking different organizations, or by reorganizing different stages of drug development.

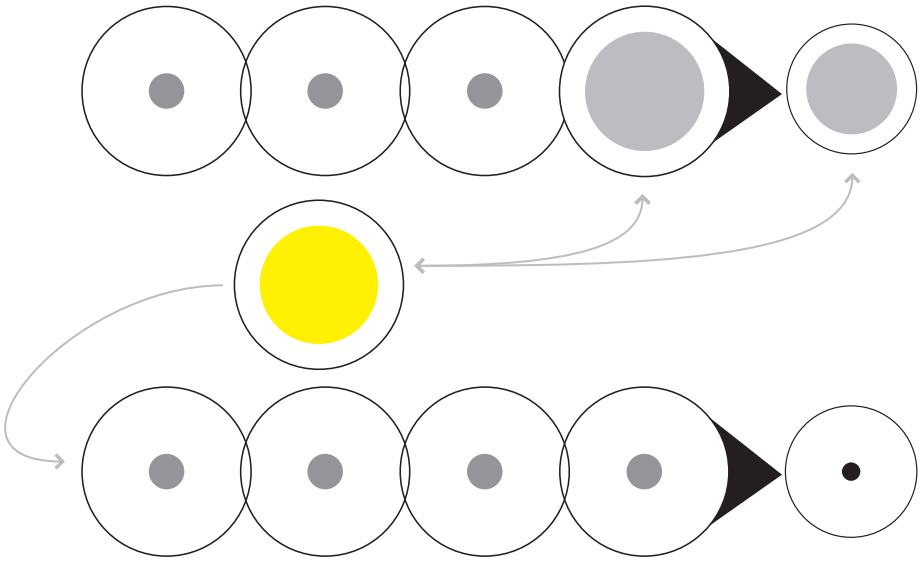
The virtual activity Business Model involves the coordination of networks of partners and suppliers to develop new drug-candidates.

Virtual Activities Business Model



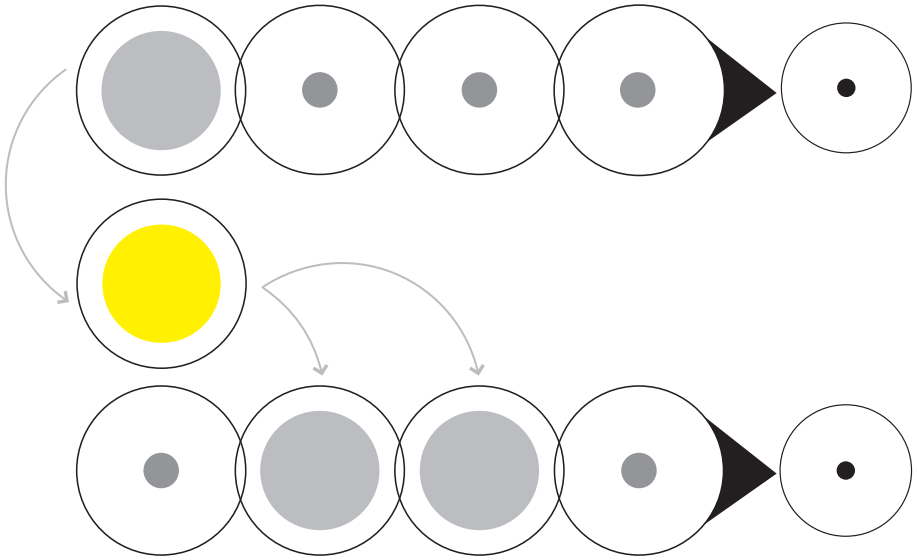
The "repurposing" Business Model involves taking a molecule under development in another company, or already on the market, and developing it for new therapeutic applications. An example would be to use a drug originally intended to combat sleep disorders to develop an application to fight acute inflammation disorders. The new clinical trials to be carried out are less complex and faster, because the molecule has already proved its non-toxicity and efficiency in a given situation.

Repurposing Business Model



The Technology Broker Business Model works in a similar way to stock brokers or brokers. They provide links between different companies or organizations. They may, for example, look for buyers for a company that has a pipeline of drug candidates.

Technology broker Business Model

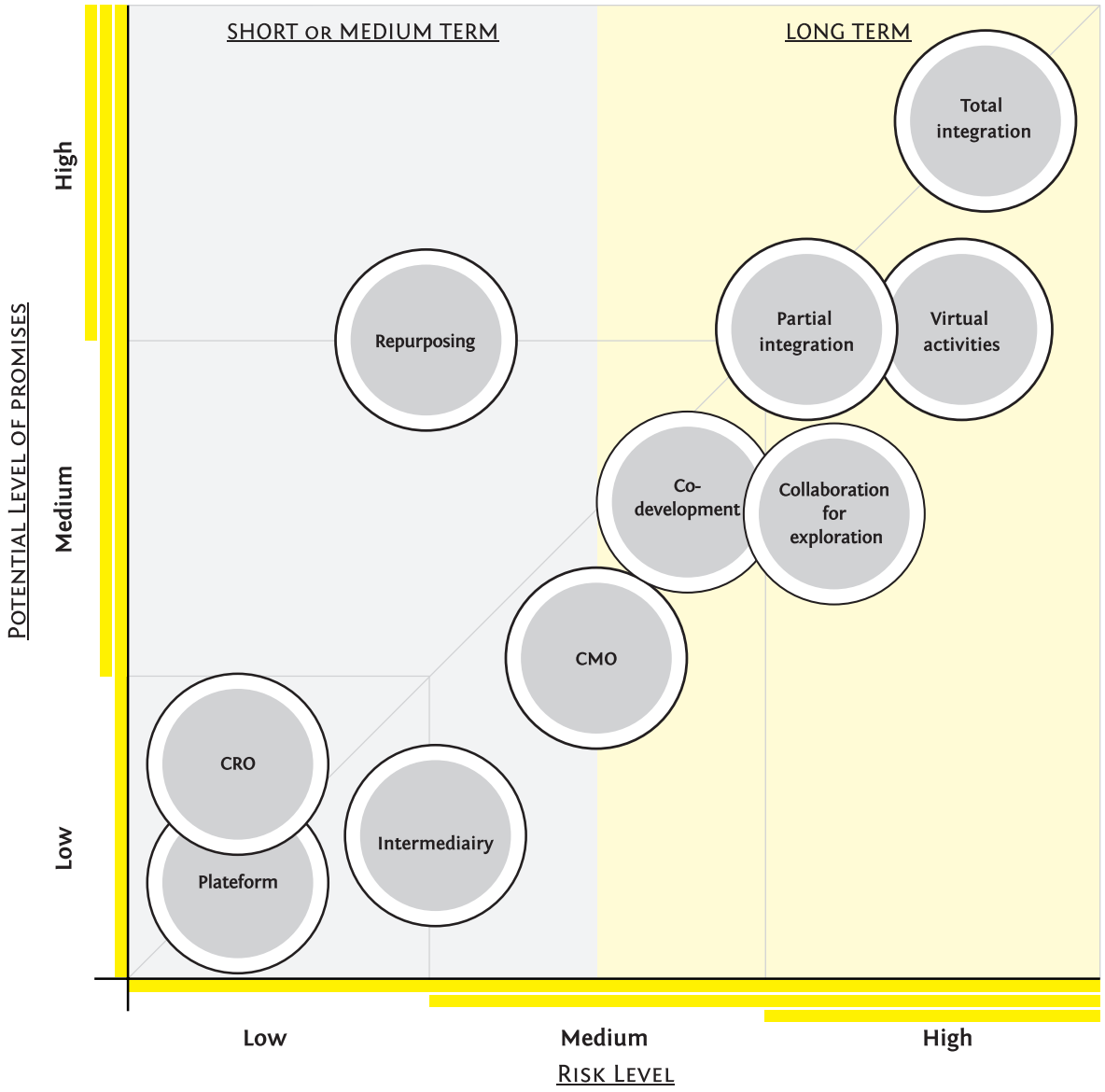


These ten generic Business Models have different levels of promise and different risks. Companies need to adapt Business Models according to the opportunities and specific situations of their own organisation.

Table 1: Impact table for each Business Model

Business Model	Level of promise	Risk Level (detailed)			Risk Level (general)
		Interdependence	Technical Risk	Financial Risk	
Total Integration	High	Medium	High	High	High
Partial Integration	Medium to High	Low	High	High	High/Medium
Collaboration for exploration	Medium	High	Medium/ High	Medium	High/Medium
Co-development	Medium	High	Medium/ High	Medium	High/Medium
Technological platform	Low	Low	Medium/ Low	Low	Low
CRO	Low	Low	Medium/ Low	Low	Low
CMO	Low to Medium	Low	Medium	Medium	Medium
Virtual activities	Medium to High	High	High	Medium	High
Repositionning	Medium to High	High	Low	Low /Medium	Medium/ Low
Technology intermediary	Low	High	Low	Low	Medium/ Low

Representing the level of promises and risks in the form of a diagram highlights the various positions of the Business Models (fig. 3).



A balanced Business Model portfolio involves having Business Models for the short to medium term with low to medium levels of promise and risk, and Business Models with higher levels of promise and risk for the long term (see the separation between the two zones of the diagram in Fig. 2). In particular, for SMEs in this sector it's difficult to support long term development without having Business Models that ensure short to medium term profitability. The case of PX'Therapeutics illustrates how a small company uses this approach to ensure its development.

2- PX Episode 1: A Business Portfolio to support growth

In 2000, PX was created and implanted in a science park in the high technology city of Grenoble in the French Alps. This region hosts two internationally competitive research clusters: the MINALOGIC cluster, which specialises in products and services around smart miniaturized solutions for industry; and LYON BIOPOLE, a centre of excellence for vaccines and medical diagnosis.

From the outset, PX based its activity on its expertise in the engineering of recombinant proteins[5] using two Business Models from the research platform's model. The first is the open-platform Business model. Here PX uses IP free technology and capitalizes on its know-how. The clients (companies and public laboratories) use PX

5 Proteins are macromolecules present in living organisms and essential for their well-being. ››››

to carry out stages of the engineering process. The second is the shared platform Business Model (a mixture of platform and collaborative models), in partnership with the Institute of Structural Biology. This latter platform allows costs related to purchasing equipment to be shared. This, in turn, enables PX to provide a new offer to drug developing clients: the high-speed production of proteins. With the two Business Models, the level of promise in terms of turnover is relatively low, but the risk is too.

From 2000 to 2003, the company developed its expertise and capacity to produce proteins. Its turnover grew steadily along with its workforce: from 14 employees in 2002 it went up to 25 in 2003, while turnover increased from 600 000 euros to 2 200 000 euros over the same period. The portfolio profile over this period supported growth of both the payroll and turnover, which was multiplied by a factor of four. At the end of 2003 the management team decided to add another Business Model to the portfolio in order to increase the level of promises.

›››› They can be used in diagnosis techniques, laboratory equipment and drugs. The term therapeutic protein means proteins that are at the heart of a drug. These proteins are complex to produce and stabilize. But it is now possible to produce a given protein in vitro by inserting its gene into a bacterium, or a yeast, insect or mammalcell. The resulting protein is called recombinant protein, the term used to identify proteins produced by cells whose DNA has been altered.

Three possibilities were identified:

| The research for new antibiotics targeting bacteria more specifically. The approach is innovative but requires considerable technological development. To carry this out PX would have to work with a public research laboratory and find a way to create value out of the molecules produced. This would involve a Business Model based on a discovery and development activity.

The discovery of new antifungal targets: PX participates in a collaborative project, funded in part by public institutions, and whose aim is to build a range of their own proteins as drug candidates. If the project succeeds, PX will also find a way to create value from these proteins by selling them to pharmaceutical companies.

The production of therapeutic proteins according to GMP standards. This project requires considerable investment but will allow larger scale production, sufficient for pre-clinical and clinical tests. The main activity here would involve process optimisation.

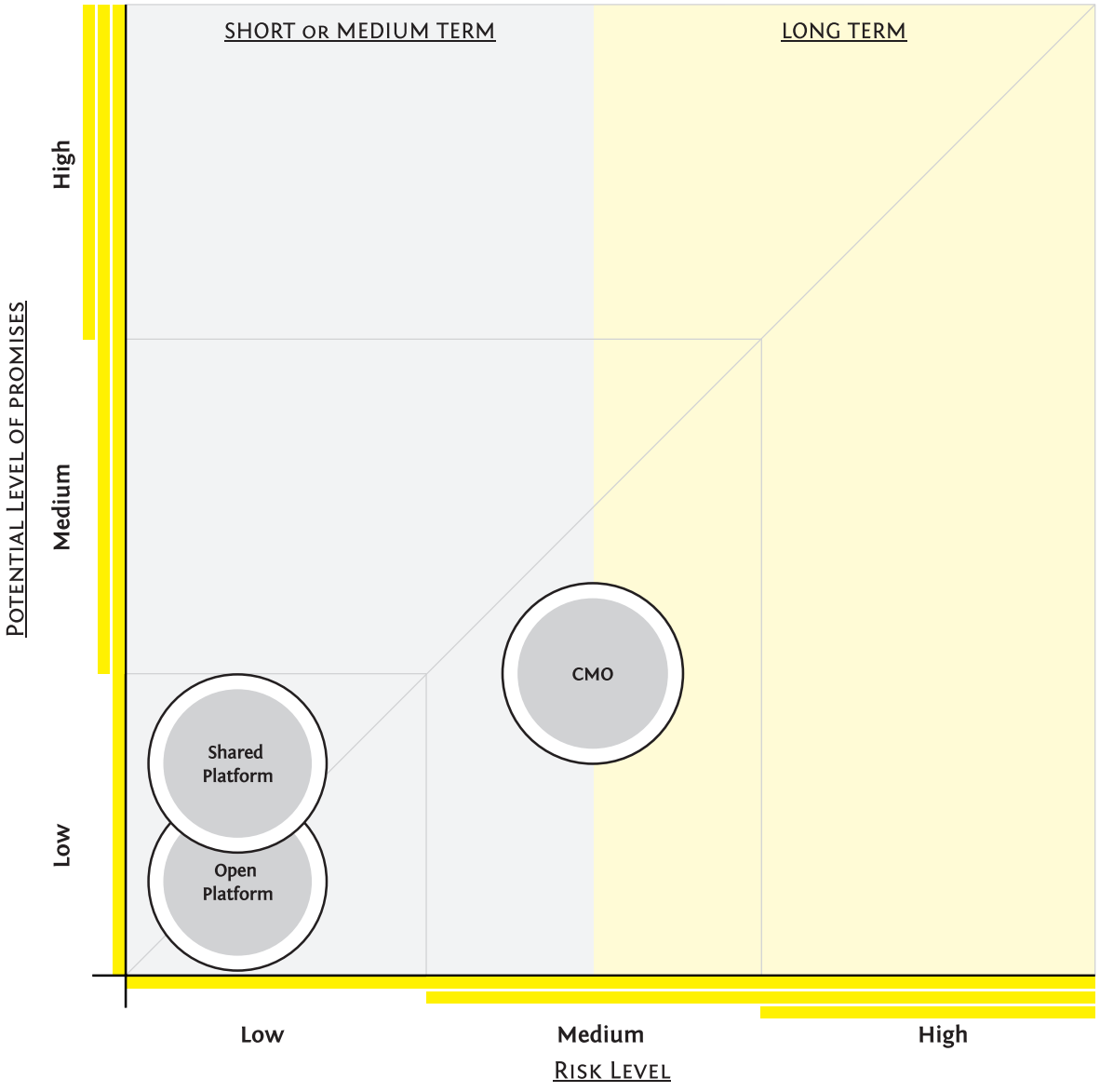
| For the management team, two criteria are important. Firstly, they want PX to continue to develop along the lines of process optimisation. It's still a young company, capable of investing, but the investments wouldn't be sufficient to set up an activity based on the discovery of molecules and the development of drugs. Also, the team believed that it would be through synergy in their Business Models that the company would be able to provide a more attractive value proposition to its clients. The managing team therefore started work on building synergy through a balanced portfolio of Business Models, creating synergy either in terms of complementary value propositions or resources used, or by being based on the existing activity of the company.

| At this point, PX was able to engineer therapeutic proteins for clients and could in addition produce them in small quantities for applied research. The next logical step would be the production of clinical batches for preclinical and clinical trials. This new Business Model is based on existing activity and, in addition, provides a complementary value proposition. By drafting a Business Model impact grid, it appeared that the promise level was more interesting and there was a corresponding small increase in the risk level (table 2, fig. 4). The choice was therefore made to set-up a production subsidiary in order to produce clinical batches. This new model was launched in 2004 under the name of PX'Pharma.

Table 2: Impact table for the 2005 Business Model Portfolio

Business model	Level of promise	Risk Level (detailed)			Risk Level (general)
		Interdependence	Technical risk	Financial risk	
Open technological platform	Low	Low	Low	Low	Low
Shared technological platform	Low	High	Low	Low	Low
CMO	Low /Medium	Low	Medium	Medium	Medium

Figure 4: The PX portfolio in 2005



In January 2005, PX'Pharma was recognised officially by the AFSSAPS[6] as being a pharmaceutical organisation. This approval allows PX'Pharma to produce and release batches of therapeutic proteins for clinical trials. The PX subsidiary is one of the first bio-manufacturing units to in France to obtain this authorisation, and this new Business Model allows to generate revenue for PX.

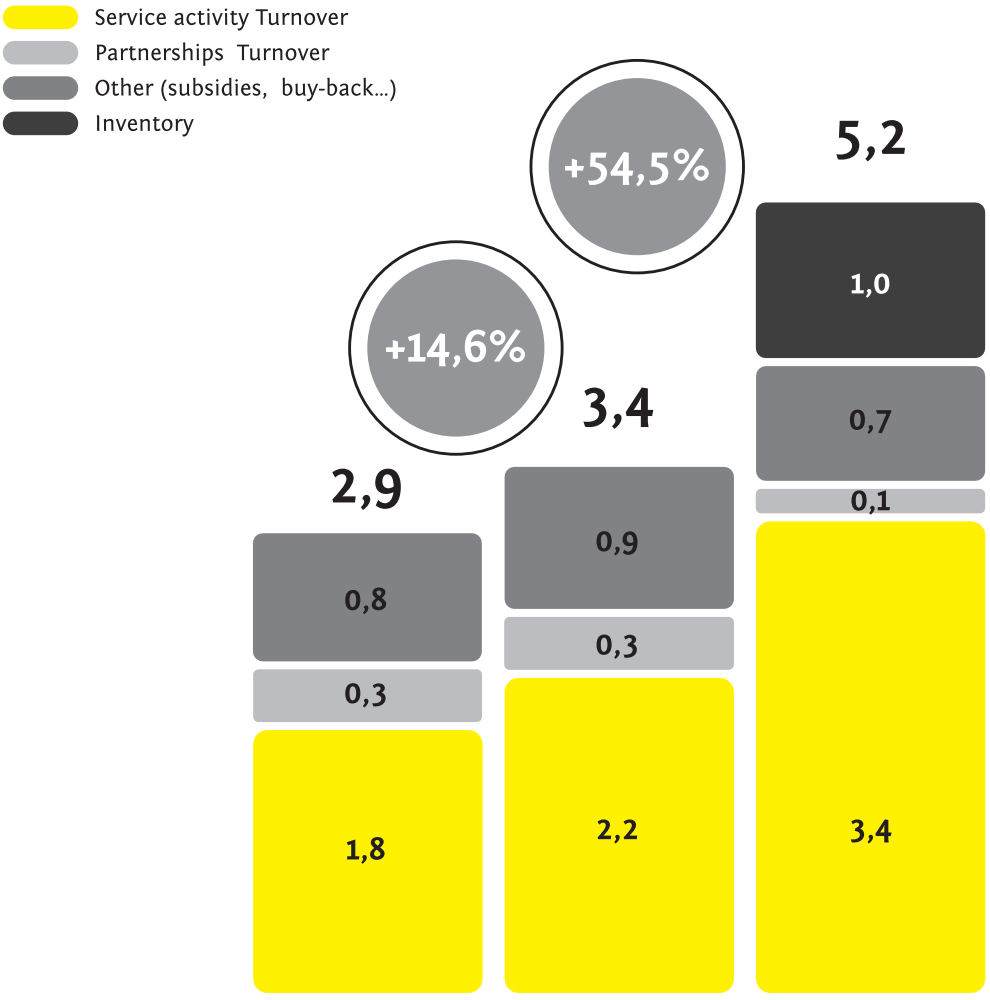
6 Agence Française de Sécurité Sanitaire des Produits de Santé. Equivalent to the Food and drug administration in the US

3- PX, Episode 2: Developing a more promising long term portfolio

In 2006, the management team identified a new opportunity, close to their core business: R&D services for monoclonal antibodies[7]. As a result, the subsidiary PX Monoclonals (PXM) was created to provide research services into monoclonal antibodies. In 2009, PX opened a sales office in Boston, USA, to develop links with the American market. In addition, PX set-up several partnerships providing know-how in protein development for drug development projects, and here started to generate additional revenues through these partnerships (fig. 5). The shared platform activity progressively became marginal and in 2010 hardly any contracts went through it. The open platform model for recombinant proteins however, continued to be central to the company's activity.

7 Monoclonal antibodies are a specific type of proteins. The market of monoclonal antibodies is very promising. Antibodies are principally aimed to fight cancers; and the Food and Drug Administration has already approved some of them: Rituxan, Erbitux, Xolair, Raptiva, Remicas or Heceptin.

Figure 5: Evolution of revenues (source PX)



In 2010, PX defines itself as a company specialised in the research, the optimisation and the production of recombinant proteins for research laboratories and companies. The company employs around fifty people. In ten years, PX has developed more than five hundred projects for one hundred and twenty client and partners,

such as Merial, Pfizer, Exonhit, Galderma, Biomerieux and Fovea Pharmaceuticals.

The company's strengths lie in its strong expertise in research and production of recombinant proteins: it is able to develop extremely effective production methods, using a range of different technologies. The company also has a good level of production capacity for the manufacture of therapeutic proteins.

In 2010, the management team aims to develop the Business Model portfolio which keeps the lower risk models that ensure the medium term viability of the company, whilst developing Business Models that could generate more revenue in the long term and prepare the technologies of the future. The Business Models on which PX's activities are based are well established, the company can therefore take more risks. Six areas to be explored are identified:

- Reinforce the company's presence in the United States. Opening the sales office in the United States doesn't appear to be an efficient way to access the market and PX is thinking about other ways of increasing its presence in North America.

- Additional co-development projects. The first co-development projects have paved the way for PX, through the acquired experience, to move into the development of a more product oriented offer rather than purely services. Co-development appears an ideal way to move towards products without going completely over to a product-logic.

- Internal development of drugs. The development of the company's own candidate drugs is a line of thought because several co-developments have already started. Some biotechnology companies specializing in services have already launched products, but they often encounter difficulties due to conflicts with their service activities: customers are afraid that they'll spend less time on their projects, or even that they'll re-use work done for clients in the development of the company's own products.

- Increasing the production capacity: PX has proved its capacity to produce batches of products for critical preclinical and clinical tests. Production on a larger scale, as done by a number of competitors, could be foreseen. One of the challenges is to develop the production of drugs using mammalcells, a technique which remains relatively undeveloped.

- Build on existing competencies. Is possible that the company find a way to use existing competencies and resources, developed over the past six years, through new Business Models.

- The emergence of new technologies, such as nanotechnologies and approaches such as systems biology, poses new questions on how the industry will evolve. In the long term, it is possible that expertise in these new technologies will become a source of competitive advantage.

To choose the next Business Model portfolio, PX first needs to analyse the existing portfolio, then go through the six areas identified to see how best increase the expected levels of promise, whilst keeping the risk level sufficiently low.

4- Methodological lessons

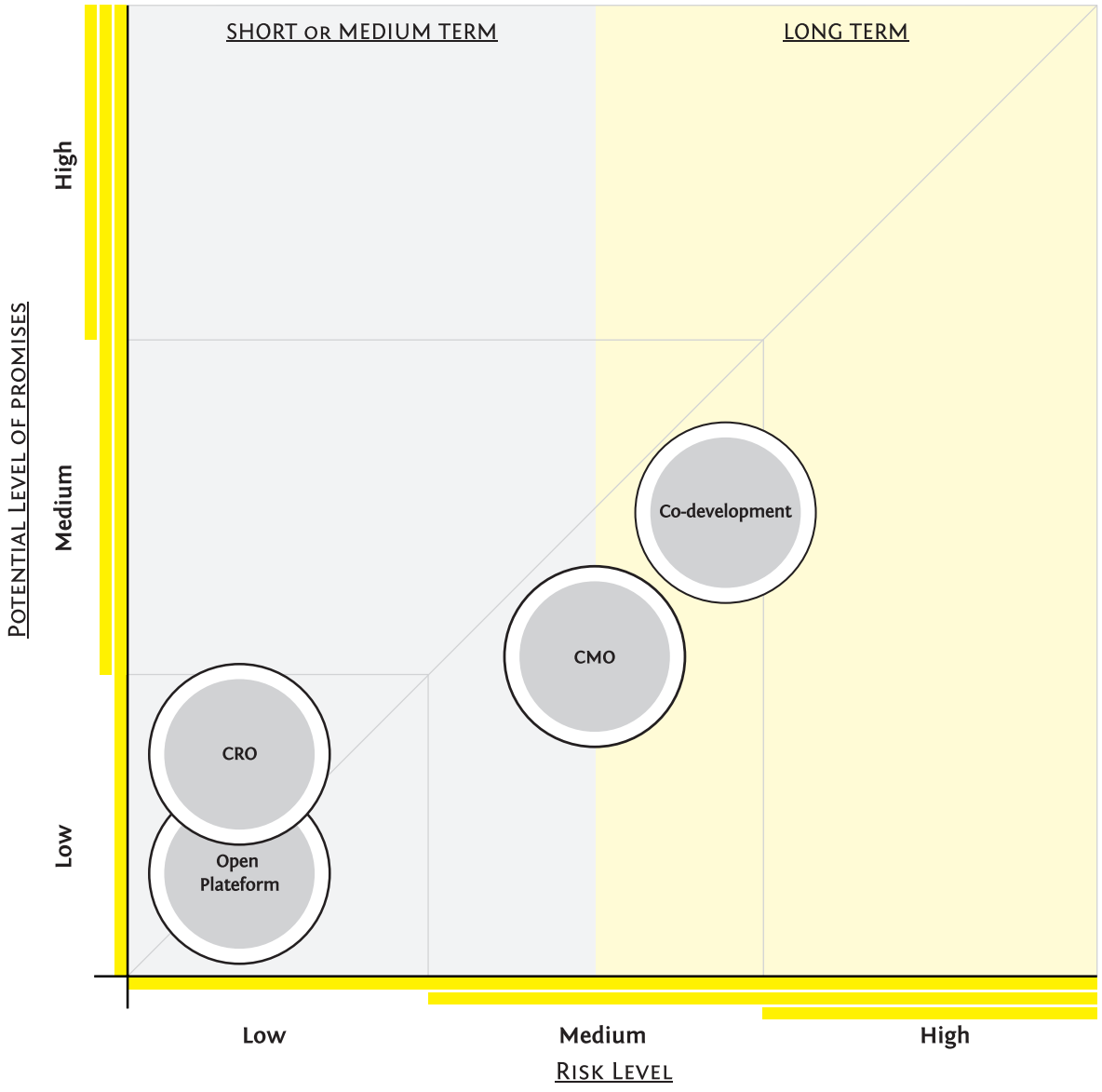
From the information above, the reader can identify PX's four Business Models at the beginning of 2010: the open platform for developing proteins, CMO for the production of pre-clinical and clinical batches, CRO for antibody services, and the co-development through close partnerships with companies that develop drug-candidates. Based on the characteristics of the four Business Models (table 3 and Fig. 6) it appears that risks are measured and under control; while the level of promise is improving compared to the portfolio of 2005.

Table 3: Impact table for the PX portfolio at the beginning of 2010

Business model	Level of promise	Risk Level (detailed)			Risk level (general)
		Interdependence	Technical risk	Financial risk	
Open techno-logical platform	Low	Low	Low	Low	Low
CRO	Low	Low	Low/Medium	Low	Low
CMO	Low/Medium	Low	Medium	Medium	Medium
Co-development	Medium	High	Medium/High	Medium	High/Medium

The platform, CRO and CMO Business Models are based on process optimisation activities. Co-development combines both process optimisation and development, which allows PX to acquire and develop new competencies.

Figure 6: The PX portfolio in 2010



To choose new Business Models, the management team must see how the new models could be developed on the basis of existing activities and on their creation by building on the resources developed thanks to the other Business Models. Next, they need to check that the promise and risk levels are balanced, and that the portfolio contains a balance of medium and long term Business Models.

For PX, based on the main process optimisation activity, three Business Models appear possible:

- Shared platform: The shared platform, developed at the outset of the company, could be re-mobilized in new emerging types of development such as nano-biotechnologies. The proximity of the Minatech research cluster could provide an ideal opportunity to create a shared platform in these new technologies

- CRO: The R&D services have given PX its solid reputation. Risk are low, the activity is well known and PX is already expert in antibodies and in recombinant proteins.
- CMO: New markets are appearing and this Business Model has more promises in terms of turnover than both the platform and CRO models. Setting up this Business Model will require investments but the need for bioproduction capacity in France is considerable.

- Co-development is a way of progressively acquiring new competencies. There is a real risk that clients of the service Business Models will view this model negatively and the times to market are very long.

- Total integration is a Business Model which is very far from the existing models and would require very high levels of investment both in acquiring new competencies in R&D and in infrastructure.

- The partial integration model would result in a highly visible activity of discovery and development with the associated risks of client alienation discussed previously. It also requires large investments.

The knowledge orchestration activity poses the question of whether or not to acquire new competencies and Business Models. The company is ten years old with a strong well developed network, a large number of clients for who projects have been successfully carried out.

- The intermediary Business Model is based on this type of resource and the company might provide the service of setting up client contacts for drug-candidate transactions as well as propose carry out the technological development and produce the pre-clinical and clinical batches.

- As far as the virtual company Business Model is concerned, PX doesn't yet have the resources not the necessary competencies. The company would have to know the whole drug development process in order to be able to coordinate all the actors. The risks are high; the cycles are long and the interdependency high.

- A very good knowledge of the network is necessary for "repurposing", but detecting opportunities requires internal researchers capable of detecting scientific opportunities. PX's researchers are more orientated towards technologies rather than products which implies a competency gap.

The management team makes three choices:

- First choice: Reinforce the Business Models based on process optimisation. Reinforcing the CMO Business Model along with the creation of a new production unit will increase risks but also potential revenue. The CRO and open platform Business Models are sustainable and efforts will be made to penetrate the American market.

- Second choice: Explore the technologies of the future. To do this, the aim is to set-up a partnership in order to spread the investment and the risks related to the technology. Having already experimented the shared platform Business Model, and due to the proximity with the regions research clusters, the management team's aim is to set up a partnership with a neighbouring public laboratory.

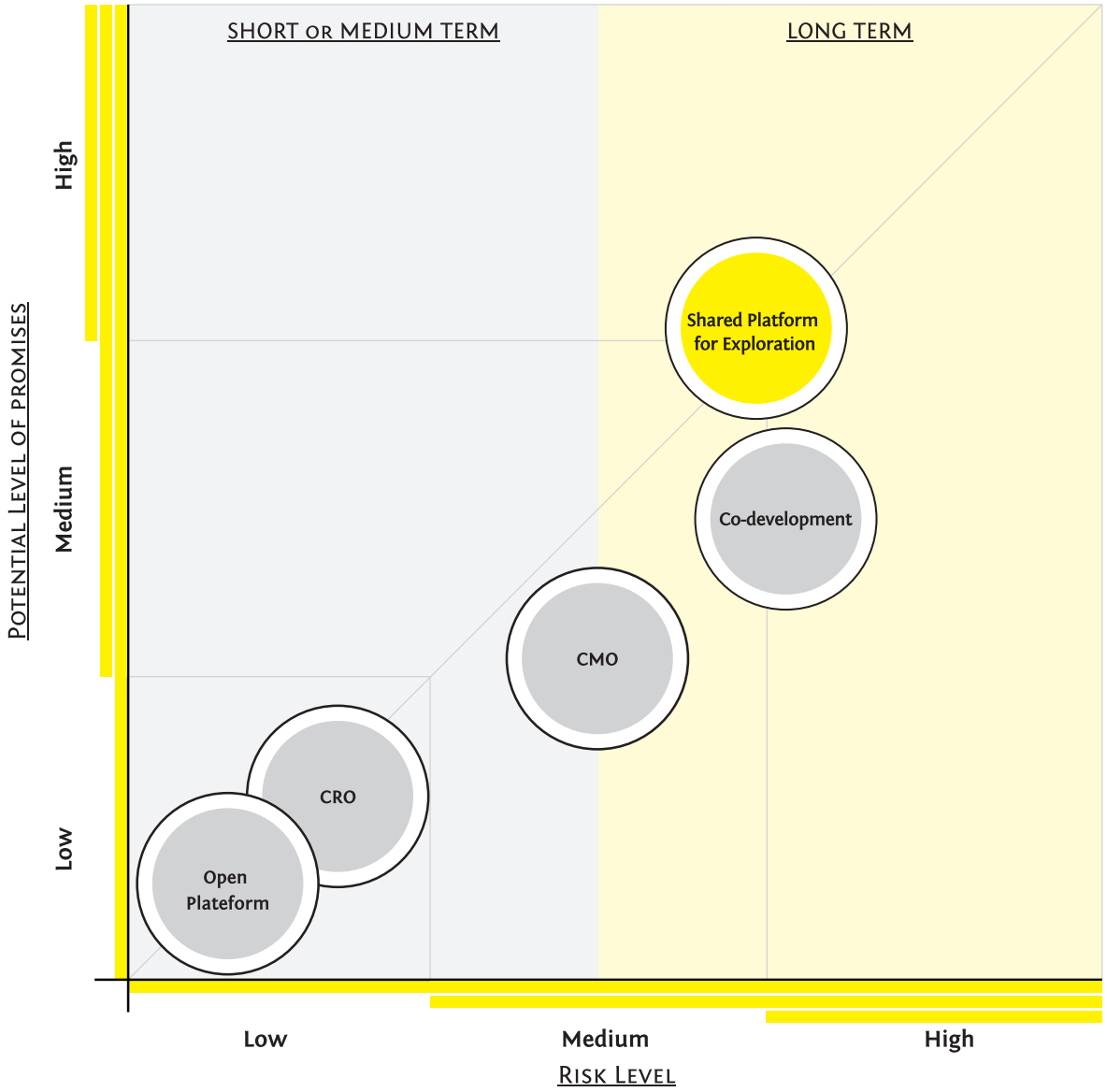
- Third choice: Progressive acquisition of new competencies. By looking over the Business Models on activities other than process optimisation, the management team agreed on progressively developing competencies in discovery and development. To do this co-development work will be reinforced. This should enable PX to improve the promise level but with relatively little increase in risk.

The new Business Model portfolio has a higher promise level and maintains an average risk level (table 4). The company has three Business Models which ensure the medium viability of the company and two more risky Business Models, but which are more promising for the long term (fig. 7).

Table 4: New PX Business Model Portfolio

Business model	Level of promise	Risk level (detailed)			Risk level (general)	*Remarks*
		Interdependence	Technical risk	Financial risk		
Open technological platform	Low	Low	Low	Low	Low	*Re-enforcement of sales in the USA*
CRO	Low	Low	Low/ Medium	Low	Low	*Re-enforcement in the USA.*
CMO	Low/Medium	Low	Medium	Medium	Medium	*Re-enforcement of production capacity (mammal cells) + re-enforcement in the USA*
Co-development	Medium	High	Medium/ High	Medium	High/Medium	*Increase in the number of projects*
Shared platform for exploration of new technologies	Medium/High	High	High	Low	Medium/High	*Shared investments in new technologies*

Figure 7:The new PX portfolio of Business Models



The strategic analysis with the construction of a portfolio of Business Models went through a number of steps which are summarised below:

1: Analyse the existing Business Models: Determine the company's Business Models and on which activities they are based. For each Business Model, evaluate the promise and risk levels and then determine overall if there's a balance between the short to medium term, and the long term business models.

2: Determine the areas to explore and that the management team will analyse. To do this, consider the evolutions in the industry and in the target markets. In the pharmaceutical industry, PX explored future technologies, the evolution of market needs and their localisation.

3: Define the new Business Models: Firstly, from the core activities on which the existing Business Models are based, imagine what new Business Models could be possible and discuss them in relation to the areas being explored. Then think through what Business Models could be created based on the resources and competencies that have been developed with other Business Models.

4: Balance the Business Model portfolio: The use of the impact grid and the associated graphical representation should show whether the various Business Models in the portfolio balance promises and risks and whether both short to medium and long term developed is ensured. A balanced portfolio should have short to medium term Business Models and long term one. The short to medium term ones will be less promising, but also less risky, hence supporting over the long term the more promising and more risky Business Models.

The management of a Business Model portfolio requires that a strategic analysis on each company Business Model be carried out by the management team. The impact grid should then be analysed at a general level. This approach takes into consideration both the medium term and long term aspects in the aim of balancing the risk and the expected benefits. It's especially for this reason, that the management of portfolios of Business Models with the analysis grid is particularly relevant for small to medium sized high technology companies.

ECOSYSTEM MODELLING TO IMAGINE THE FUTURE OF BUSINESS WITHIN R&D PARTNERSHIPS

The **SENSEI** European consortium,
building the "Future Internet"

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Innovation may overturn what, how, when and with whom we do business, in short, the Business Model. Collaborative R&D in technology is nothing new, but to improve project results by taking into account business aspects and strategic challenges along with the usage perspective from the outset is more original. "Telecoms" is a good example, because current evolutions alter so many other domains: one European R&D project is earmarked here as a case study.
The focus is to propose a framework which aims to help integrate business aspects in collaborative projects from the outset. The main subject developed in this chapter is the mapping process leading to a "Business Role Reference Model".

Introduction

Business models are usually described for a single firm. But innovation is not a "do-it-alone" activity. Firms participate in a vast range of collaborative projects. They gather to mutualize capacity and expertise but also for the benefits that they can each obtain to serve their own strategies.

These projects share the common motivation of imagining new devices or services, and for some the aim of paving the way for new industry standards. In Information Communication Telecommunications (ICT), the unspoken dream of many actors (amongst them the European Commission) is to relive the advent of the GSM, when a standard for global mobile telephony emerged from Europe. The telecoms industry is interesting to look at when considering new ways of doing business, insofar as the innovations produced by the industry itself address so many different domains, from health and transport to housing and logistics.

Taking the case of the SENSEI project, which ran from 2008 to 2010, the business dimension of innovation is looked at in a very specific manner. The issue here is not to have a market description of an innovation, as the market and the innovation are still a long way off (between 5 years and 10 years according to the stakeholders involved) but rather to foresee the possible futures for business.

The purpose of this chapter is to present the design of an approach which takes the business perspective into account throughout the duration of R&D projects. The retained approach involves creating a "*business model framework*" based on the abstract notion of "roles", amongst which one particular role is notably important: that of "broker".

First, we will present the main issues of the SENSEI project to introduce the challenge involved in the business approach. Then, a scenarios based methodology will be presented involving a field enquiry and development of cases. The following phase emphasises and explains the mapping of the global business environment which is the main outcome of the business side of the project. Finally, the zooming-out underlines the actual motivations of stakeholders, their various roles and the implications.

Collaborative R&D project

Calls for tender launched by national or European bodies, usually concern "*techno-push*" projects in which the technology agenda comes first. Then, the usage and the economic dimensions are tested at a late stage in the course of the project, even though, from the outset there is more to it than just technology. Firms each have their own agenda for the project, some being more visible than others. They spend large amounts of money to enact strategic choices, to respond to real business expectations. They bet on the future. Why, therefore, do stakeholders enter the game in collaborative R&D projects? What do they expect? How do they manage to draw benefits from their involvement in a situation involving co-innovation?

The focus here is to open the black box of technologically-oriented projects to gain some understanding on how the business stance is taken into account. In this type of situation, the assumption is that the innovation is not yet embedded in one pivotal firm, but rather is to be distributed among the consortium members during the project. The term "ecosystem" is commonly used to tag any representation of the context: we propose a constellation of roles, relations and value descriptions in a global model.

1- The SENSEI project

The SENSEI project is one of the numerous EU initiatives in ICT (Information and Communication Technology). It is funded by the European Commission and aims to contribute to promote further development of the internet (The Future Internet Portal, http://www.future-internet.eu/). In the language of pan-European projects, it is called the "Real World Internet Dimension of the Future Internet" through an all-encompassing infrastructure designed to "integrate the physical with the digital world of the network of the future" (SENSEI public online presentation, 2010). This means extending and linking up everyday objects from cars to the kitchen fridge, for which new applications and services are to be foreseen. The SENSEI project started in January 2008 and was set for three years ending in December 2010. The SENSEI consortium involves multi-disciplinary expertise split among 19 partners, including leading industrial organizations, universities, small and medium enterprises, and research centres.

2- The "horizontalisation" paradigm for services

The technical challenges have to evolve in the way that they are dealt with today: currently, most technical ICT solutions are specific to one domain of use or even one situation of use. The layered and open SENSEI approach involves making technical solutions accessible and manageable through a global and "*pluggable*", or ready-to-use, sensors and actuators (remotely operated devices) to be linked through an integrated network in order to develop sophisticated integrated, so-called "*horizontal*", solutions. In this context "*horizontalisation*" refers to the re-use of information provided by sensors, processing and actuation services. These are all remote actions incorporated in different "*islands*" (zones): for example from one place to another, from one domain to another, from one service to another.

The ambition of SENSEI is, therefore, to move away from specific classical value chains to an ecosystem of non-linear value systems. SENSEI provides the *horizontalisation* of interfaces from all of the sensors and gateways via the "*SENSEI system framework*" providing an open global services interface for applications. In other words, SENSEI aims to offer the capacity for a marketplace to design and market applications and services.

3- Modelling challenge

The main purpose of the mapping process is to define a global Business Model framework that presents the business options, operative alternatives, and models for different phases (e.g. deployment, run-time, and maintenance), etc. At the centre of this all is the "*Business Role Reference Model*" which features the roles and their

relationships within the ecosystem, in which the SENSEI system would operate. Relationships are defined mainly in relation to the values offered and the rewards (or incentives) returned. Roles are described according to a number of attributes that define rationales for doing business, incentives related to the business and values created and exchanged.

This generic model is an abstract representation of the environment. It depicts the position of the project in the imagined future. It combines entities that are assumed to be needed, with the relations between them. The model developed in this chapter is the output that helps the stakeholders define their own strategy and Business Models.

Scenario analytical thread

Within the SENSEI project a full work-package is dedicated to the socio-economic analysis which involves academia and the companies of the authors of this chapter. The methodology used follows a scenario-driven approach, coined "scenario-based design" (ISPIM 2009; FIA Prague Book 2009). It is based on a portfolio of scenarios and involves a Field Enquiry followed by a breakdown into use cases that are the analytical atoms used for modelling. This whole process feeds into the technical design of the SENSEI system as well, giving a common viewpoint for all the partners as well as providing the grounds for analytical cross-fertilisation between them.

1- Development of scenarios

At the beginning of the project several application scenarios are created in a variety of areas. These application scenarios are based on the specific industrial sector expertise of the industrial partners and academia within the consortium. They are chosen according to the agenda of partners as well as the anticipation of future usage development such as: mobility in cities, equipment in closed spaces, crisis events, logistics and security in manufacturing plants. The scenarios allow users to picture themselves in the imagined future scenes, which is vital for the identification of "end user requirements" (or targeted functionalities to address users' main expectations). However, not only potential end users could picture themselves in the scenes, the scenarios themselves provide information based on which SENSEI experts can identify "key adoption drivers" (leverage to adopt a SENSEI system), "business rationales" (motivation to enter the business) and "critical success factors" for several application domains.

The scenario elaboration process is used to integrate the potential users and business stakeholders' viewpoints into the project. First, SENSEI academic and industrial partners consolidate and use their knowledge of the consumers, users and business actors of the sectors concerned. An example of a scenario generated by the team is illustrated below.

Box 1: Multimodal transport scenario

Caroline shares a car with her boyfriend. They use the car in turns. To be flexible when her boyfriend needs the car, she subscribes to the SENSEI-enabled Web Based Car Pool Application. A driver picks her up at a nearby ice-cream parlour and together with another passenger they travel from the suburbs to their respective workplaces in different parts of the city. They meet in the morning using a web-based service that enables subscribers to use proactive car-pooling, depending on their real-time situation and agenda. Each morning the system informs Caroline with whom she will be travelling, and where she will be picked up and dropped off. Matchmaking of travellers includes recommendation capabilities based on history and social graphs in order to ensure "safe companions". Caroline appreciates the Web Based Car Pool Application as she can avoid public transport which stresses her a lot.››››

›››› Caroline's journey planning is facilitated by a web-based journey planner which links to the live (dynamic) information service fed by the road authority's networks of sensors, which are embedded in road networks and which provide information on the state of the roads, traffic jams, and accidents as well as information on weather conditions such as snowfall, humidity, precipitation, etc. The journey planner also relies on information from other sources of a more static or semi-static nature, e.g. on-going road works. For more long term journey planning, projected information like planned road works or weather forecasts can also be used. Caroline is eager to get the fasted and most reliable connections. She hates to spend time in traffic jams that she could have spent with her son. She is happy that she can rely on the journey planner service especially if she is at home with her son but on-call for her work.
The journey planner relies on several ways in which it can deliver its plans; via mobile devices, navigation devices, built-in Human Machine Interface (HMI), car equipment, or even digital signalling available at commuter exchange points such as trains stations. These can be triggered to deliver customized information based on Near Field Communication (NFC) enabled mobile phones. The car also transmits information to the road authority's network regarding speed, distance travelled, use of windscreen wipers (to estimate precipitation), potholes detected by acceleration sensors, etc. Throughout the group's journey, this information is continuously updated.

2- Business enquiry

The aim of the business enquiry is to understand how a SENSEI system could transform the value chain (or multiple value chains spanning multiple application areas) and how it would alter the way the stakeholders do business. A portfolio of scenarios is therefore developed (The portfolio includes the multimodal traveller example described above (see box #1)). Multimodality in transport is, amongst others, a high priority issue for the SENSEI team, as it to be in line with the evolution of transportation, sustainable development and associated values. This concerns more especially city environments and such issues as: sustainability, quality of life for commuters, deployment of building infrastructure, etc.

The field enquiry helped to select the realistic "business logics" (combination of roles related to SENSEI, whether centralised or more distributed) in a number of different domains. In the transport domain, to which the scenario refers, some key ideas can be outlined. Whether within an urban area (as depicted in the SENSEI showcase) or without, the key roles are operators and Service providers (such as ticketing, information release, catering) as well as Public authorities. Several interviewees, though not necessarily in the transport domain, said that public transport and cars are on the verge of convergence, thanks to car-pooling (several users in one car), car sharing (one car for several users), and sensors embedded in all kinds of vehicles and on the road networks. To provide a few examples, this may cover road tolling, information release, control and transmission of information to people, integrating different transport modes for an efficient network. Over the next 5-10 years it is believed that transport is set to experience an IT revolution.

3- Analysis of use-cases

The next stage involves the breaking down of each scenario into a number of use-cases to test the assumptions gathered during the field enquiry phase:

- For "*car-pooling*", SENSEI facilitates the connection between users' personal islands (mobile devices, geo-positioning, etc.) with the real-time information on their situations and behaviour in order to feed the described applications:

car-pooling according to user profiles/needs and billing mechanisms depending on real behaviour/journey metrics. SENSEI also allows the connection of the on-board intelligent car-system in order to get information on energy used.

| For *"web-journey planning"*, SENSEI allows the integration of the Caroline's geo-positioning devices/sensors into the application system (whatever the network) as the car is going through in the city (and whatever the sensor being used). SENSEI provides dynamic information on the position of buses (and other public transport vehicles) whatever their location within the city and whatever the sensor devices they use. The SENSEI system also allows information on customers to be captured by installed sensors wherever they are i.e. it enables the capture of information on the customers' presence. It also allows for the easy addition of new detectors of presence throughout the city.

The business analysis singled out the service features in the scenario: *"Car Pooling service"* (matching different traveller itineraries and agendas with available cars, and suggesting companions based on a history of social graphs and personal recommendations) and a *"Route Planning service"* (carrying out the actual route planning and route optimization taking contextual information and possible itineraries into account amongst other things and therefore being able to incorporate all transport modes.)

In addition to this, the opportunities for SENSEI playing a brokering role, or how the SENSEI system might play a pivotal role, could be seized by an Application Service Provider (In this case a, *"Location Information Provider"*) by collecting, gathering and brokering dynamic current information on: weather, road infrastructure context and as well as aggregated contextual information on traffic and vehicles.

Mapping the ecosystem

The major difference between the SENSEI framework and the traditional way by which services are created in ICT (Information and Communication Technologies) is that the SENSEI's functions make *"horizontalisation"* possible i.e. the re-use of data and information resources across different domains. This is reflected in the Business Role Reference Model by the introduction of the role of *broker* around which a value model is built from the associated value chain, or chains. This is done by combining other roles (those of providers and users).

1- The broker's role

The broker is the hub of the SENSEI ecosystem, operating key functions and triggering the development of services. It collects, organizes and distributes data from the Resource Providers, above all through detection, actuation (or remote actions), and processing services that target the SENSEI Resource Users. The latter are mainly application service providers and developers.

Therefore, the broker's key resources are sensor data and any valuable information that can be delivered. The major value proposition provided to the Resource Users is firstly, the discovery and suggestion of adequate resource, and secondly, providing access to the resources. The value proposition for the Resource Providers is the promotion of their resources (which means money for them if their resources are used, e.g. via pay-per-use systems). The cost structure is based on the hosting by SENSEI of key functions and directories such as the Resource Directory. It also includes costs that are associated with activities such as support tasks (e.g. billing). Revenue might be generated via subscription fees which depend on the usage queries submitted and other features, or a registration fee for programmers. Application Service Providers may have to pay for access to data from the Resources based on a pay-per-use model. There may also be a revenue stream from the Resource Providers (see box #2).

2- Business Model Framework

To carry on the business analysis, the last and probably most the challenging step is to draw an archetypal ecosystem with constellations that focus on revenue streams and value propositions. This stage follows on from the scenario-driven approach by placing different use-cases into a scenario. The scenario involves setting and assessing the various business roles needed and the relationships between them and, as mentioned previously, this is done with a focus on revenue streams (monetary flow) and value proposition (value delivery). An abstract business role constellation model, called the "*Business Role Reference Model*" (or BRRM, see box #2), is designed by testing the assumptions on each role based both on various use-cases and on different scenarios. The important step in this phase involves zooming-out of the scenarios and use-cases and combining the common links between all of them.

It is all the more important to stress that the "*Business Model Framework*" (BMF) does not provide a Business Model, which remains to be designed by each concerned stakeholder. The constellation mapping, also called here the "*Business Role Reference Model*" (BRRM), does not encompass one sole pivotal actor around which the full constellation is drawn, but rather a constellation with multiple actors, what we call here the "ecosystem".

Box 2: Role Model for the Multimodal scenario

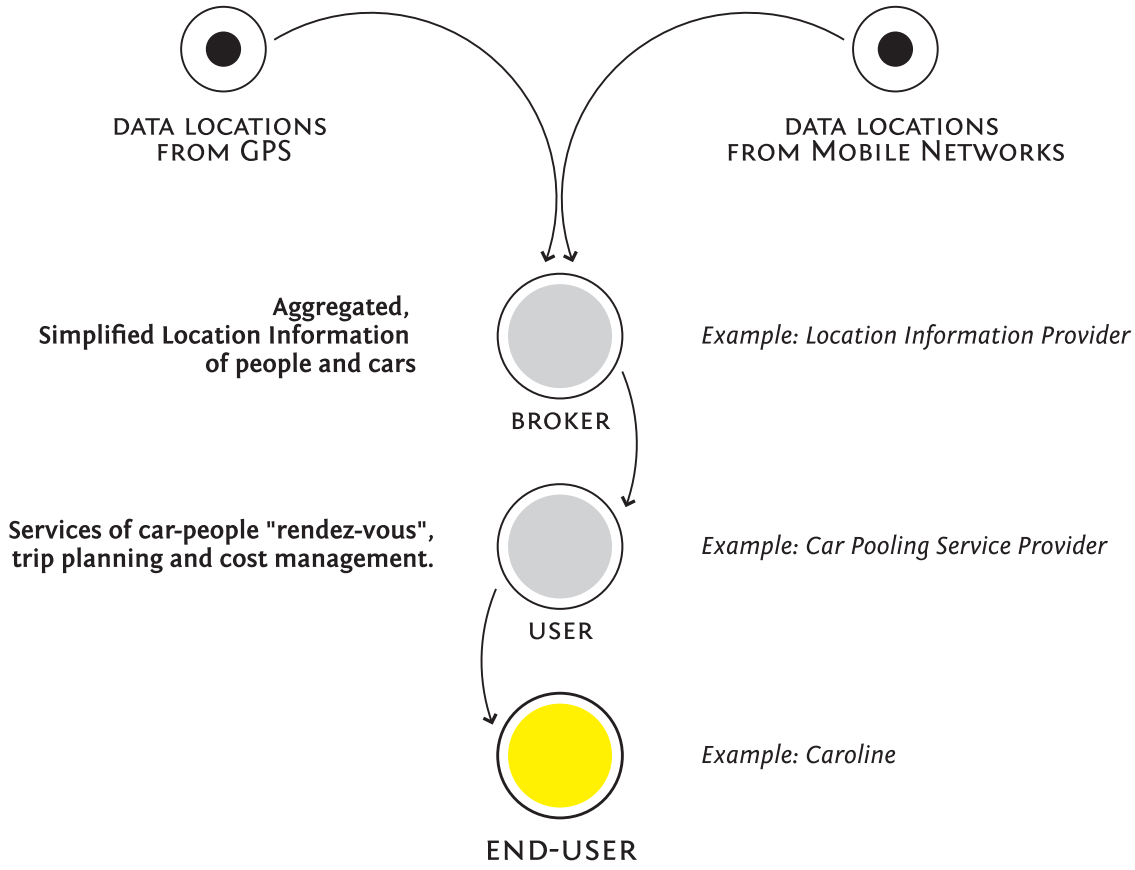
The full set of roles* has been the reference for the whole business analysis process so far. The simplified model is based on 3 clustered roles: Providers, Brokers and Users:

- The **Provider** provides data from a vast range of possible resources (GPS location, Mobile Network location, etc.).

- The **Broker**, who may be an Application Service Provider (as in the scenario presented) acting as an intermediary between consumers of services and service-providers. It may also involve peering with other brokers. The Broker can provide "real-time" unprocessed sensor information; it can also provide aggregated information and services including automatic sensing and actuation.

- The **User**, for the main part Application Service Providers who provides end-user oriented services, i.e. delivers the services to the Application Service Consumer according to an agreement between the Application Service Provider and the Application Service Subscriber. The Application Service Provider typically builds its service using service components provided by other service providers. For this purpose, the Application Service Provider can use a Broker or have a direct relationship with the other service providers.

For the multimodal scenario (see box #1)



There are 2 types of access to the future "Real World Internet" (RWI):
1/ "open business" or easy access to data regardless of provider (the traditional Internet model),

2/ "closed business" or secure uniform access to business-critical-services with quality assurance.

In short, there are incentives for developing applications over and above the SENSEI system and these involve providing more attractive business opportunities to SENSEI stakeholders by opening up new horizons of "RWI" markets.

To create and capture value, a multi-fold revenue mechanism is to be set up. The choice between different options is up to each individual stakeholder according to their own Business Model and strategy. For instance, it is not up to the SENSEI consortium to decide whether an end-user should pay his/her fee via a subscription, per-use or at a flat rate, rather this is the stakeholder's choice. We can also imagine that advertising be used to fund the service provider, or that, to a certain extent, the service is delivered free of charge.

Last but not least, a Broker means true "horizontalisation" when it provides information to different Users across numerous domains such as Cities, Building Management, etc. while relying on the same range of Providers. This model is therefore the backbone for SENSEI's full Business Role Reference Model available in the Business Delivery of the Consortium (SENSEI, 2010).

Actual stakeholders behind roles

Business roles (which are abstract notions) and stakeholders are different. Each role is carried-out by different stakeholders, in some cases competitors. Also, one stakeholder may play several business roles.

For all participants in a project like the SENSEI project, to have a view of the ecosystem is to better understand the context in which they operate. The time, hence the

investment, spent in the initial phases of the project is therefore vital to its success. The resulting overall project description is designed to be reshaped and adapted by the project partners according to their own strategies and business priorities.

For business partners especially, the questions to be addressed are:
- Who could play what role?
- Are we ready for it?
- Are we able to deliver the value?
- Can we build on this to build our own Business Model?

To address these issues, the business partners participated in a work-package dedicated to usage and business analysis.

Telenor from Norway was one of them, and was instrumental in shaping the Business Model Framework. The company participated in the SENSEI project both on the technological and the business sides. They are an example of the Application Service Providers, even being able to broker services. They don't belong to the transport domain as such, but are very active in the B-to-B area. To them, the whole Business Modelling process provides the basis for informed strategic choices to be made after the completion of the SENSEI project (see box #3).

Box 3: Application Service Provider's view of the originality of the whole process in relation to their own benefits from their commitment in the SENSEI project.

Telenor took part in the SENSEI project in order to increase the quality, efficiency and commercial success of its research and innovation activities in the M2M (Machine to Machine) area. The scenario-driven approach used in SENSEI including mapping of corresponding ecosystems provides good means of identifying service innovation opportunities, in collaboration with partners working as innovation enablers. The enabling takes place when partners' capabilities (knowledge and technology) are combined to create a new, larger market opportunity that delivers an enhanced end-user experience and generates new revenue.

In this respect SENSEI supports an open innovation process. While innovation is traditionally carried-out within the boundaries of a company (closed innovation model), Chesbrough (2003) argues that companies should bring their in-house innovation activities to market and open-up to collaboration between internal employees and external stakeholders (open innovation model). According to published theory, these inflows and outflows of innovation resources will increase the innovation capability of the company, and in this way, its competitive advantage.
The objective of the whole business process in SENSEI is to provide tools to actors in order to help them identify their positions in an evolving ecosystem. This includes the identification of valuable resources, partners and of the most appropriate Business Models. Issues of particular interest to Telenor have been: to get a new value system up and going and to make it sustainable, to gain an understanding of barriers and opportunities and when to collaborate and when to compete (strategic positioning as the market evolves), to increase "the size of the cake", to stimulate other players to take risks, and to identify cornerstones, to develop and promote enablers for the new value system. ››››

›››› Service innovation and application development within M2M has similarities with long term partnership initiatives in Telenor (and other network providers), e.g. with the establishment of a market for premium content. In that programme a mechanism for offering and getting paid for content (CPA - Content Provider Access) was identified as an enabler for the ecosystem and quickly became a cornerstone in the new value system. SENSEI functionalities (e.g. horizontalisation) might play a similar role in the M2M sector.

Conclusion

The Business Role Reference Model appears as a value chain (see box #2) with the *"broker"* in the pivotal role. From top to bottom where the users are to be found, each step adds new value from data to information to service. According to Gambardella (2010), this is the case for *"general-purpose technologies"* for which innovative firms gain all the more by capturing value via the multiplication of applications. This is exactly what is aimed at using the concept of *"horizontalisation"* in the SENSEI project.

The full Business Model Framework is an up-to-date multi-staged process, which is relevant for other collective innovation projects, notably as no technological prerequisites are required:

- The first step involves selection and enhancement of scenarios.
- The selection of scenario is based on a set of criteria that are key to the SENSEI innovations. This provides a first level of formalization: the scenario portfolio along with the detailed characterization of roles. Even at this early stage the business perspective is already taken into account.
- The second step involves describing the different parts or scenes of each selected scenario
- This is done to identify actors and roles, values and rewards. The various ecosystem descriptions are detailed for each particular scene to include the detail of the associated roles attributes and relationships.
- The final step of developing the business framework is to perform an analysis and synthesis of the different value systems
- This is done by identifying patterns and commonalities within the system. The outcome is a merged reference model, called the BRRM (Business Role Reference Model).

This framework is quite an abstract tool, but linked to very operational agendas from a large panel of stakeholders. A project like SENSEI gathers representatives of small and big companies along with several R&D institutions. The involvement of industrial stakeholders is at the core of this kind of project. They were present at all stages of the process.

Knowing about the roles in the environment of the Future Internet (sometimes called the *"Real World Internet"*), a stakeholder could find constellation mapping a powerful tool to provide the first insights on the business aspects of their project by concentrating on the core components of a Business Model, namely: the business partners to interact with, the overall business network, the revenue generation mechanisms, the revenue flows, and the value propositions. This is why constellation mapping is also a key element:

- zooming-in on a business role, it provides clues for the Business Models of each organization,
- zooming-out it gives the overall picture, which is necessary to understand the ecosystem and to prepare for changes and rivalries.

As explained, the method proceeds by a double movement going from particular (detail) to general (global) and from general to particular. Initially, scenarios are required to assist in understanding, in the definition of scenarios and in the identification of key issues. Next, a more abstract phase of work is carried out in order to create a generic (global) model of the ecosystem which can be applied to different contexts. This model is developed with the aim of assisting the various economic actors in the project in the development of value propositions from the technology being analysed. For us, this approach and the abstract-model of the ecosystem have the advantage of favouring the collaboration between different economic actors (in some cases competitors) engaged in collaborative R & D and working on strategic issues. They can work on the project, move forward together and define the structure of the ecosystem without having to reveal (or compromise) their individual strategic intentions.

QUESTIONING THE CONCEPT OF VALUE

From Business Model to the emergence of new markets

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The chapters in this book give us a view of the particular moment in the development of *value*, the *value proposition* and the *value network*. Here, there is no timeline! Rather gradual emergence of the *possibility* of a market by mutual adjustment of the value proposition and market values, and the implementation of the market by the value network.

We know that once the market in place, the structures freeze, demand is known and, if it evolves into a requirement, it will look for the same types of service, the competitors have taken up their positions and try to make the best profit possible; intermediaries are also in place and their necessity is recognized, the rules, tacit and legal rigidify the market processes. Certainly, the system evolves, but progress is slow until the next innovation.

Each chapter presents only a part of the process of looking for new values through innovation, but the whole book put together tells a common story, that of the creation of a market.

Here, we are going to attempt to tell this story. The main difficulty comes from the need to describe the emergence of a system whose elements, along with their interrelationships, start by being barely discernible before taking form at about the same pace.

We will have to deal with reality by proceeding in two stages. Firstly we present the three elements that make up the heart of the market system: the consumption values on the demand side, the value proposition and the value network on the supply side. We will then look into the dynamics into the emergence of a new market through the dynamics of the relations between these three elements as well as the variety of configurations of new markets, both from the offer and the demand sides.

1. Value, Value Proposition and Value Network

If a market is the "meeting between offer and demand", then figure 1 illustrates our vision of the market. Demand attempts to satisfy its values, the offer makes a value proposition and has to set up a value network in order to produce it and take it as close as possible to the demand.

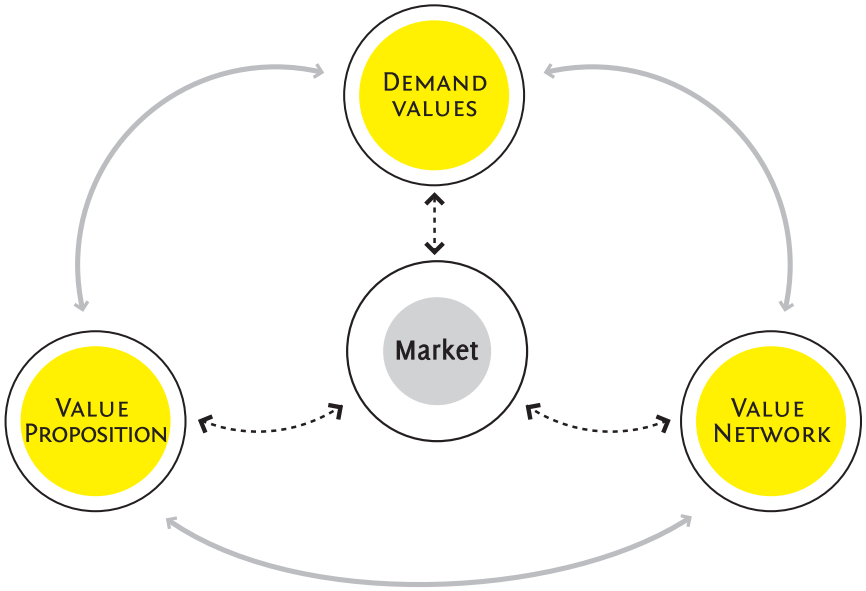

Fig. 1: The market at the point of interaction of demand value, the value proposition and the value network

The mystery of a market may lie in developing harmony between these three elements. Indeed, though all three include the word value, they don't give it the same meaning

1.1. The values of demand

We will first present the notion of value and then go on to show that value differs according to whether the client is an individual or an organisation.

1.1.1. The notion of value

Following centuries of research on the complexity of value, notably in philosophy and sociology, the business world has taken over this notion. With its usual pragmatism, it uses the concept of value in some cases to designate value for the client (exchange value, usage value) and sometimes for the shareholder (value creation, economic value).

Obviously our concern is more on the notions of *exchange value and usage value*. The first refers to the sacrifice that the purchaser is willing to make in the purchase, the second to the benefits he or she hopes to get from the usage of the product. Obviously the exchange value depends on the usage value; the higher the usage value, the higher the consented sacrifices.

For economists, the usage value is first of all the utility. It concerns what the product can do (a car allows us to go from one place to another independently, in safety and comfort). It quickly became clear that utility was not the only component of usage value. Other elements such as fun, social influence, self-expression, etc. also participate in the usage value of an automobile, for example. We are therefore led to speak more generally of *consumption values*.

Usage value is the sum of the consumer values that are satisfied by the use of the product minus those that are not. A car can, for example, satisfy a value of efficiency in transport as well as an image value towards others, however, it may seem insufficient as far as safety or environmental protection are concerned. The individual must therefore make a compromise between these various consumer values, a compromise that will have an influence on the usage value.

1.1.2. Individual values and organisational values

Several consumer value systems have been put forward. The most complete example seems to be Holbrook's (1999). For this author, individuals make consumer choices according to eight values: efficiency and excellence (economical values), play and aesthetics (experiential values), status and the esteem of others (social values) and finally ethics and spirituality (altruistic values).

Amongst the examples in this book the Microoled case presents a product aimed at the consumer or end-client: smart glasses for sportsmen and women (notably cyclists). It is easy to illustrate Holbrooks structure of values with this example; the *efficiency* concerns the control of the essential parameters and the reading comfort, the *excellence* concerns the feeling of having the most up to date equipment, the *play* is related to the fun of displaying the information on the glasses whereas the *aesthetics* depends on the design of the glasses, acquiring the *status* of a serious and responsible sportsman through the purchase and the *esteem* of others for having acquired this innovation in response to social values. Finally the individual expresses sports *ethics* by taking care of himself or herself in action and gives themselves divine powers (*spirituality*) by knowing instantaneously what is happening in their body.

Though marketing researchers have carried out a considerable amount of research on *consumer value* for individual clients (B to C), relatively little has been done on *consumer value* for organisational clients (B to B)[1]. Most of the examples presented in this publication (**Axane, Eveon, PX'Therapeutics, Schneider Electric and Sportganizer**) describe business contexts where the targeted client is a company. This enables us to look into this question a bit further.

The first value is of course financial. For example, the **Schneider Electric** offer above all enables the client to make savings, though many other organisational consumer values are presented in the cases described in this book.

1 This subject is treated in special issues of the Industrial Marketing Management (2001 and 2006)

- **Axane** provides teams with *comfort in filming* (autonomy of the camera, absence of background noise) the *availability of actors* who are no longer bothered, the *pride* of the teams in participating in an environmentally friendly production, the sense of excellence…;
- **PX' Therapeutics** offers their clients access to high level competencies that they don't have themselves and that they need;
- **Schneider Electric** enables clients to increase the lifespan of their installations and participates in the emergence of a feeling of pride for those working in a low energy consuming building;
- **Predictys** aims at providing advertisers with a complete service (therefore simpler to purchase) and a more efficient service (through the integrated file qualification process);
- **Eveon** enables laboratories to reduce the risk of loss of reputation whilst providing a source of differentiation and a competitive advantage;
- **Sportganizer** who targets two organisational clients, sports clubs and sports equipment suppliers (two-sided market) has two value propositions:

  - For the advertisers the offer is to provide *qualified targets* that are *interested* in their product
  - For the users of the service, the offer is useful (more fluid and effective organisation) but also social (the platform favours and facilitates social interactions amongst members of the association).

It therefore appears that organisations, though they may at first look at first for the financial value, also look for other types of satisfaction from the propositions that they receive. We suggest retaining two dimensions for organisational consumption values:

- **Impact:** this can be *internal* if it is related to internal processes and *external* if it re-enforces market position;
- **Effect:** this can be *financial* if directly translated into monetary value or *non-financial* if it has an impact on the strength of the position of the company by re-enforcing its current resources or providing access to new competencies.

This structure (Table 1) results in four categories of consumer value for an organisational client: cost reduction, increase in the value of the offer, efficiency and performance of internal processes, re-enforcement of the strength of the market position.

		Effect	
		Financial	Non-financial
Impact	Internal	*Cost reduction* • Reduction in purchasing budget (EVEON) • Reduction of management costs (SCHNEIDER ELECTRIC, AXANE)	*Efficiency and Performance* • Access to a technology, to knowhow (PX' THERAPEUTICS) • Internal social link (SPORTGANIZER, AXANE) • Process efficiency (AXANE) • Communication efficiency (SPORTGANIZER, PREDICTYS)
	External	*Increase in offer value* • Higher sales price (EVEON) • Sale of additional products (SCHNEIDER ELECTRIC for the HVAC manufacturers)	*Strength of Market Position* • Image, reputation (EVEON) • Competitive advantage (SCHNEIDER ELECTRIC) • Position in the value network (SCHNEIDER ELECTRIC)

Table 1: Types of values for organisational clients

1.1.3. Summary

The usage value depends on the client's consumption values. These values are multiple, pushing us to talk about bundles of values, which are more or less satisfied when using a given product.

Faced with a marketed offer, the customer, whether an individual or an organization, evaluates the offer by estimating the overall level of satisfaction of the value it provides. This estimate is based on values that increase satisfaction, but also on those that reduce satisfaction. The value proposition will result in a positive exchange value if its bundle of values results in a higher level of overall satisfaction.

1.2 The value proposition and the value network

The value proposition and the value network are described throughout the book and are central themes in the "Business Model" approach. They are used to characterize the innovation strategy in terms of both the values that the innovation aims to satisfy for certain categories of customers (value proposition), and the position in the domain that the innovating company intends to occupy (the value network). The performance of the Business Model will be determined at the interface of the value proposition and the value network. Not only is it important to design a value proposition that meets (and satisfies) values but in addition the company must still find a sustainable and efficient network structure to deliver the value proposition to the customer.

1.2.1. The notion of value proposition

When a manager talks of "value proposition", it is generally not the consumption values that he thinks of first. Generally the first thought is the exchange value. The value proposition corresponds to the offer that is provided on the market and which must be profitable. This is confirmed by Anderson and Narus (1990) who define value as "... the worth in monetary terms of the economic, technical, service and social benefits a customer receives in exchange for the price it pays for a product offering". Therefore, the value proposition proposes an exchange between an anticipated usage value and part of the financial and non-financial resources of the client.

Kaplan and Norton (1996) define the value proposition as being "the description of the unique mix of product, price, service, relation and image that a company offers to a group of targeted clients. It must explain what the company thinks it is capable of doing for its clients better or differently from its competitors". From this, the definition of the value proposition, if it makes reference to client values, it must take into consideration offers provided by competitors.

The authors of the chapter on the **Schneider Electric** case present a value proposition based on the interaction of two factors: the sources of value and the description of the offer. The following figure illustrates this vision based on the **CALORIE** offer made by **Schneider Electric** for building managers.

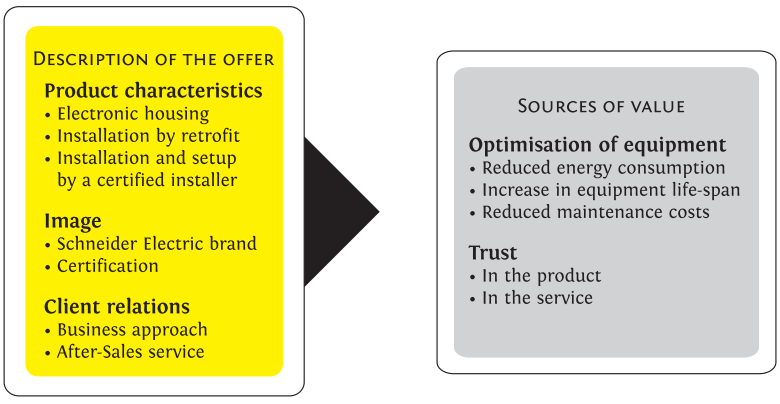

Fig. 2: Value proposition of the Schneider Electric CALORIE offer

It is interesting to note here the appearance of *trust* amongst the sources of value. Trust here corresponds to a judgment of the purchaser on the validity of the offer and the credibility of the provider. The main consequence is the psychological comfort of the purchaser and we know the impact of this variable on a purchasing decision.

The examples presented in the book allow us to illustrate the concept of value proposition. In addition they make it possible to explore the internal structure of this notion. We will now focus on two specific characteristics of the value proposition: the fact that it can have an embedded structure and the possibility to create a new value proposition through a unique and original combination of existing value propositions.

Nested, or embedded, value propositions

Sportganizer and **Axane** illustrate this case. Both companies have to develop quite elaborate value propositions based on technological competencies, in the Web 2.0. area for **Sportganizer** and hydrogen fuel-cells for **Axane**. To do this, they have to use core technology: **Sportganizer** has to develop a management platform for a sports club and **Axane** needs to develop a mobile "plug and use" system from hydrogen fuel-cells. This, however, still doesn't suffice as both companies have to develop complete packaged offers: by developing specific options for **Sportganizer** and through the design of a rented kit, along with technician, for **Axane**.
From this we deduce a specific characteristic of value propositions; they are often made up of nested value propositions. Tables 2a and 2b illustrate these two examples of nested value propositions.

TECHNOLOGY	OFFER DESCRIPTION	SOURCE OF VALUE
Rental	Design service: rent equipment + technician	Integrated service
Mobile model "plug and use"	Mobile generator	Mobility, Easy to transport
The "hydrogen fuel-cell" technology	Hydrogen fuel-cells	Silence No pollution

Table 2a: Nested values for AXANE

TECHNOLOGY	OFFER DESCRIPTION	SOURCE OF VALUE
Complementary functions	Other services	Management of the club's social life
Sports club management platform	Turnkey interactive site	Interactive management of the life of the club
Web 2.0 Interactive system	Interactive system	Each individual can intervene

Table 2b: Nested values for Sportganizer

New value created by combining value propositions

PX Technologies and **Predictys** illustrate a situation where the combination of unit value propositions can result in the creation of an innovative value proposition.
Predictys entered the market with the traditional position of web advertising agency. Thanks to active work on R&D, the company developed an editing platform which enabled them to offer the services of content editor. The editing platform, at the heart of the new offer, enabled Predictys to integrate multiple tasks: create and qualify editorial content, obtain more precise information on the Internet users through their reactions, monetize the file. This platform therefore allows **Predictys** to provide a new innovative offer by arranging together offers that had hitherto been separate from each other: content creator, web board, router and monetizer.
From the outset, **PX'Therapeutics** combined two Business Models, the open platform and the shared platform to develop an innovative offer: the high speed production of proteins. In 2005, having obtained the status of a pharmaceutical company, PX'Therapeutics added new value propositions to its portfolio; the production of batches of therapeutic proteins for clinical tests. Next was the production of monoclonal anti-bodies and co-development in partnership. Finally, in 2010, two new propositions were launched; the exploration of technologies for the future in shared platforms and the co-development of molecules. The company can use this base to develop a unique offer built on the company's high level of expertise and through developing specific know-how. The company seems to be navigating towards a promising "Blue Ocean".

Summary

The value proposition is issued by the company. The latter has one goal, that of providing the customer with a level of satisfaction of his/her values, so that in turn the customer is willing to sacrifice some of his/her resources. In addition, the value proposition must be credible, and notably should inspire confidence.
In many cases the value proposition is developed based on technologies that competitors are equally as proficient in. The company must therefore make a unique value proposition. The book suggests two tracks: nest several levels of value proposition from the technology or find a way to combine independent value propositions in a unique way.

1.2.2. The value network

The value network describes how the different activities involved in developing, producing and bringing the offer to the targeted client, fit together, whether they be internal or carried out by third parties.
Designing the value network
In the examples of innovation studies in this book, the value propositions are often nested. This signifies that the innovative technology is nested into a product or a system, which is in turn nested into a unique solution or service. Christensen and Rosenbloom (1995) precisely associate this notion of value network with the modularity of the products and systems that make up the system. Despite the fact that theoretically all the components of a system can be supplied by one single company, they are in reality more often supplied by specialist companies and are exchanged on the market. This means, generally speaking, that a product's architecture corresponds to the organisational system architecture made up of specialist companies each working on components that make up the product.
This vision supposes that the partners and necessary competencies exist within the company's ecosystem, which is not always the case. For example in the Schneider Electric case, the new value proposition requires the presence of a network of competent installers to implement the solution. Before being able to deploy the solution the company therefore has to ensure that the required competencies are in place, for example by recruiting and training the network of installers.

Define and negotiate an advantageous position in the network
The value network can also be viewed as a playing field on which a particular competition, named "co-opetition" by Brandenburger and Nalebuff (1995), is run. For these authors, the value network is *"a schematic map which represents all the players in the game and the interdependencies amongst them"*.
This viewpoint, when compared to the previous structural vision, implies not only representing the actors who will help deliver the value proposition, but also the links and relations between them. A value network is therefore a true relational system which can last over time: *"a value network is any web of relationships that generates tangible and intangible value through complex dynamic exchanges between two or more individuals, groups, or organizations"* (Allee, 2003).
In the case of **Axane - Air Liquide**, the direct supply to the production teams is acceptable over the exploration phase, but would probably not be so later on during the operational phase. It would probably be necessary to go through the rental networks that the production teams work with to rent their equipment, and invent new win-win ways of working with them.
The innovative company must therefore imagine a position in the network, and decide what activities it will carry out itself. It must seek profitable areas (Christensen, Raynor and Verlinden, 2001) and decide what part of the network to cover. To do so, it combines a number of different value propositions. This is what Predictys did reinventing the company's strategic positioning.

Design a sustainable ecosystem
In an innovation context, it is important to be able to work on these partnerships within the value network very early on. However later on, when they have been negotiated, the balance may be different and the value proposition may have changed. The concept of Business Ecosystem (Iansiti and Levien, 2004) suggests the idea that a company's strategy aims largely to create conditions that are favourable for its own activity. This is the case of two-sided (and multi-sided) markets. For example **Sportganizer** has to obtain the backing of the sports federations to get as many sports clubs as possible on the platform, hence more sportsmen and women and then finally the sponsors who will finance the project.
The value network must there be thought of as a Business Ecosystem that structures exchanges, but it is also important to consider moving outside the initially defined perimeter of the system if, for example you cannot find a partner capable or willing to take on board a part of the value proposition. This can become necessary at any point in the business project. This was the case of **PX'Therapeutics** who diversified its portfolio of activities giving it several possible positions in the value network. For **Sensei**, this is a central theme of the project and involves defining a number of possible configurations of the value network so that each member of the research consortium can define what role(s) it can play and what Business Models they will develop around the technology (in coherence with their respective strategies).

Summary
Client values, the company's value proposition, the value network, at this stage the key players of the adventure are in place. The three players will now start moving under the impetus of the company's will. Initially far apart they will start coming together and, perhaps, make a market emerge.

2. The process of creation of a market

The three basic building blocks of the market must be connected for the market to be created. The task is complex. We must first establish a strong relationship between the value proposition and client values. Next we have to see how the innovative company can derive the maximum benefit from its innovation. By continuing to build on the examples presented in the book, we will try to clarify these two stages of market creation.

2.1. Link the values to the value proposition

The client values and those of the value proposition are different. The first are beliefs that guide choice. The second is an offer which aims to satisfy client values based on a technology. The key lies in linking them.
This link appears to be created in two stages: the identification of a target and the search for compliance.

2.1.1. The identification of a target

Microoled, **Axane**, and **Schneider Electric** provide illustrations of this process. This phase is described in detail by Millier (1986, 2000). At the outset, the company owns a technology that has a unique feature. We need to understand applications that could benefit from this unique feature and identify customers who use these applications. This process has several characteristics:

- **A combination of intuition and rationality:**
  Microoled's management is attracted to sports (intuition), but the potential segments are identified, studied and evaluated (rationality);
- **Profitability is not the only decision criteria:**
  Schneider rejects the first target as it is not sufficiently profitable (profitability criteria), but Air Liquide supports Axane as a way of carrying out a "strategic watch" (prevention criteria);
- **At the outset what will connect value and value proposition is unknown**
  At the moment a target is selected, no-one knows what will bring value and value proposition together, we only know at this stage that the connection appears possible and profitable (based on the positive reactions obtained during testing).

This last point is probably the most surprising. When a target is identified, neither the value proposition nor the related client values are known or under control. Creating a market means defining and linking these two elements.

2.1.2. The emergence of the market

At the beginning, the company formulates a rough value proposition, mainly based on the supposed benefits of the technology. It is rare that this first proposition provokes the enthusiasm of the targeted clients. We will see why first.
The company now enters into a trial-and-error phase which enables it to refine its value proposition. At the same time, the company discovers and helps clients discover what the benefits of the offer are. We will see in a second stage why the formulation of the benefits is necessary to set the relationship between the value proposition and client values.

Why are the first reactions negative?

When confronted with an innovative value proposition, clients often react negatively at the outset. Some of them, innovators (Rogers, 2005) or lead users (Von Hippel, 1986) can be interested, but for the most part this is not the case. The chapters of this publication suggest two reasons for this: the hierarchy of values and the importance of usage context.

- **The hierarchy of consumer values:**
  As the client aims to optimise the satisfaction obtained from his bundle of consumer values, it is important to know their internal structure. An error in the hierarchy of values can radically change the destiny of an innovation. Two cases in the book give us examples of this:
  For Schneider Electric, the promoters were the first targets envisaged for the system aimed at optimising temperature control equipment. They were quite interested in the offer, as it could help them to lower construction costs.However, the reduction in the building running costs was a top priority for building managers. They therefore became the priority target.
  Microoled's value proposition is centred on a double advantage: a smaller screen

that is also easier to read. We would be tempted to highlight these advantages but investigations showed that aesthetics is more important than efficiency for the clients. The Microoled glasses therefore have to present an attractive design over being practical.
How can we evaluate the relative importance of each individual consumer value in the evaluation of the overall value of the offer? For example, how can we know whether, in the Axane case, the economy of usage is more or less important than the comfort of shooting? Various methods can be used to reply to this question. The KANO method, the trade-off method and the Tetra-classes method of Llosa all appear adapted.

The importance of the usage context

The usage context is the interaction between the aims of the user and the physical and social environments, etc. in which the user finds himself (or herself) at the moment the product is being used. The value proposition implies that we have to identify and understand the usage contexts:
Organisation of sports events (Sportganizer), cycling runs (Microoled),
"Intervene in confined spaces where access was previously impossible" or "provide power for outdoor film shooting" for Axane.

It appears that the users have built routines for these usage contexts. This is what the film crews had done, using diesel generators to film at night **(Axane)**, or nurses avoiding pricking themselves accidentally with syringe needles. These routines are generally perceived as being satisfactory. Innovation is therefore confronted with a first problem, the absence of a perceived "need" from the targeted client.
It becomes necessary therefore to guide the targets into thinking differently about the usage context in order to simultaneously bring to light the imperfections in the routine and show the value of the innovation. This is how Axane succeeded in convincing the film crews and how they had previously convinced the firemen. Finally, it is worth noting that the context can impose specific content as in the case where **PX'Therapeutics** has to obtain the status of pharmaceutical laboratory in order to be able to provide batches of proteins for clinical tests. In the same way, **Schneider Electric** had to obtain a certification to legitimise its value proposition.

From the value proposition to values: the role of benefits

Benefits are the advantages that the client obtains through the use of the product. Despite the closeness in their meanings, values and benefits are not the same. Benefits are the consequences of product use, while the consumer values result from customer choice. The example of **Axane** illustrates this.
The table 2a presents Axane's value proposition once it had been developed. We know that the development was difficult and was done progressively. In reality, it appears that the film crew little by little over time started to appreciate the benefits of the offer:

- The first source of value proposed by Axane is the mobility that the solution provided. The customer benefit is flexible use of the camera. The director's scope for creation is broadened and filming is more efficient (internal value non-financial)
- The second source of value involves the absence of sound pollution which itself results in three further client benefits: the quality of the sound-track, which results in a gain in time (savings) and the quality of the sound (increased value of the film), the serenity of the actors, which helps them be better (higher value of the film) and the serenity of the teams.
- The third source of value involves the absence of atmospheric pollution. The client benefit here is the psychological comfort of the film crew, happy to be able to respect their (potential) ecological values and proud to be part of a high quality team.
- The last value source is the integrated service. The client benefit here is the absence of worries about electrical installations. It involves the fact that it provides the opportunity to improve the filming process.

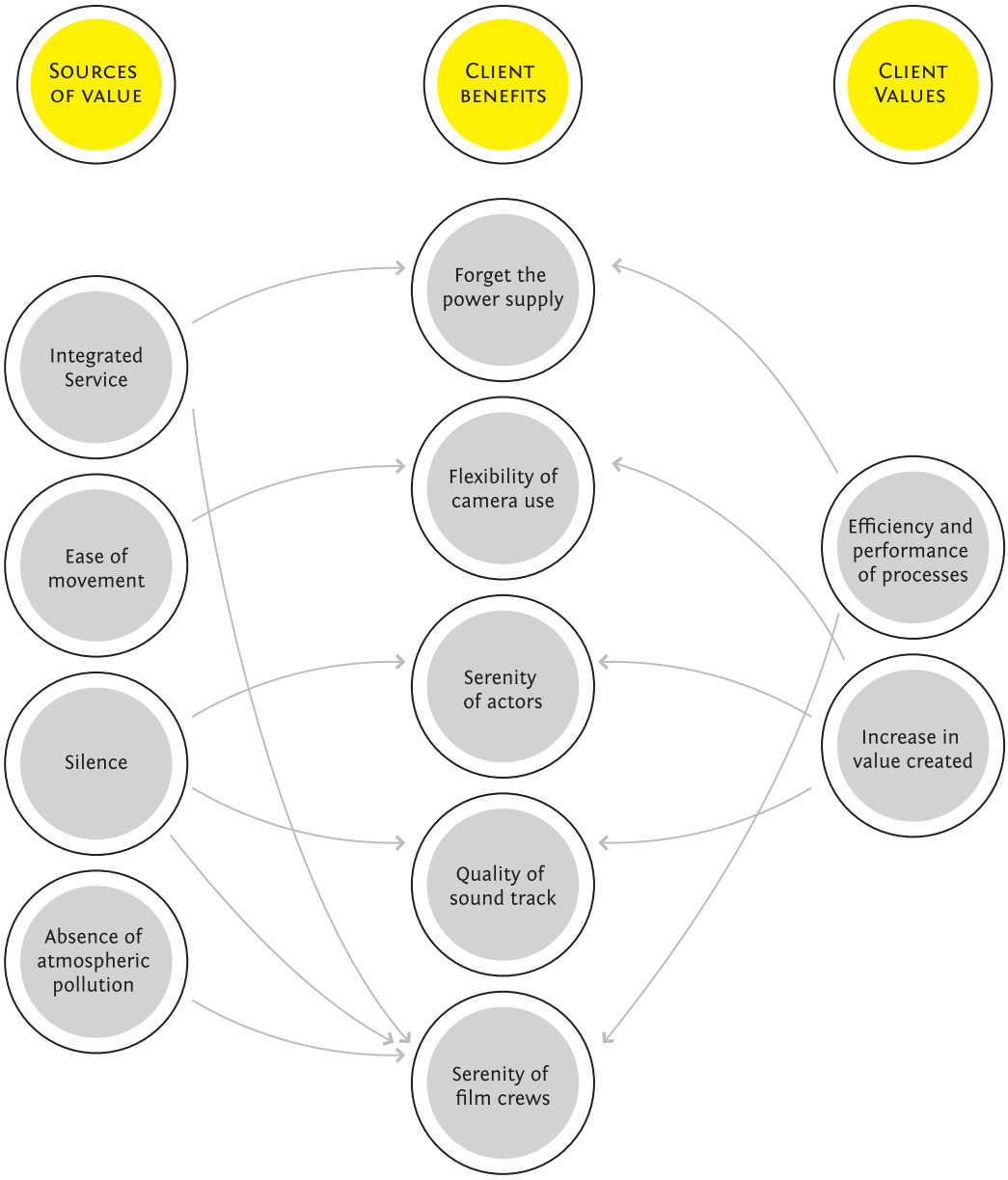

Fig. 3: The client benefits between value proposition and value

Once these relations discovered and established between value proposition, benefits and values, the company had to get over one last obstacle: convince the client of the reality of the solution's monetary value by demonstrating the real costs of the previous solutions. The cost of the PAC remains higher but then the service rendered is too.

Finally, we note that the client develops his value judgments about the benefits he cannot really assess such as the increased potential for creativity and the actors' and film crew's serenity. This underlines the large leeway that exists between possible pricing levels in this type of case due to the large part played by subjectivity.

Finally, the market slowly takes shape. Figure 3 illustrates this phenomenon.

Ultimately creating a market means linking a value proposition to the client's values through customer benefits. This raises the question of the distribution of the value created.

2.2. Value sharing over the value network

Value and value propositions exert a real influence on each other. We would now like to propose a generic tool to guide managers in developing their value proposition by taking into account not only this reciprocal influence, but also the different types of interaction between the actors in the ecosystem. Our proposal is based on an initial finding; the values that can emerge from an innovation are closely related to the interaction of the actors involved in the deployment of the Business Model. In addition, the issue of value capture through the implementation of relevant revenue models becomes a critical and increasingly complex issue for the innovator. The typology we propose is as generic as possible - value propositions based on the structure of actors in the system. To do this, we define the actors on the basis of six questions: Who is innovating? Who produces? Who is offering? Who needs it? Who uses it? Who pays?

We regroup these six questions into two broad categories, one representing the "demand" and one representing the "supply". Obviously this is fairly arbitrary and may not correspond exactly to today's reality which is often more complex. This representation is mainly based on the way our industrial economies function from a historical point of view. It can be simply represented by the following figure:

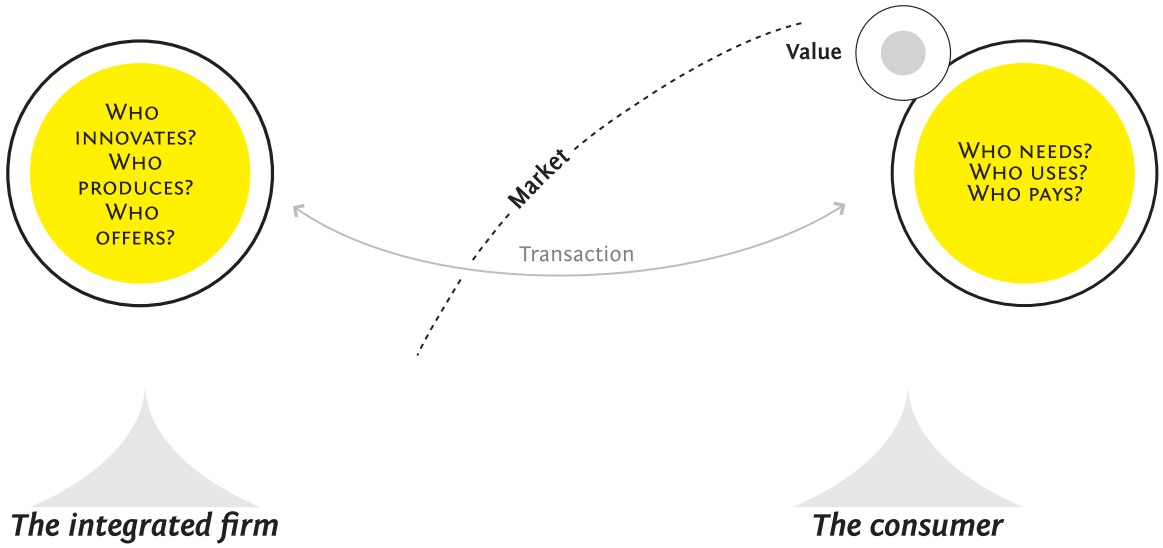

Fig. 4: A "historically simple" value proposition.

This figure represents a configuration that dominated the "thirty glorious" years with mass production carried out by integrated companies and where value is positioned, expressed, exists with the end client and user. This model corresponds to the situation where value and value proposition are in direct relation with each other. It is to be noted that in this configuration the question of value capture for the innovator doesn't pose any particular difficulty other than the formulation of the revenue model based on the industrial context and the power relations between "client" and "offeror" (see Cachon 2003 for a synthesis of traditional revenue models for B2B).

All the case studies presented in the chapters of this book show that the evolution of innovation systems radically changes the way value is created and transcribed in value propositions.

From innovator to innovative network

The first evolution that we will consider involves the separation of the actors on the offer side. In other words, the case where the innovator is no longer the producer or the case where the producer is not the actor who offers the product on the end-market. (cf. figure 5 below).

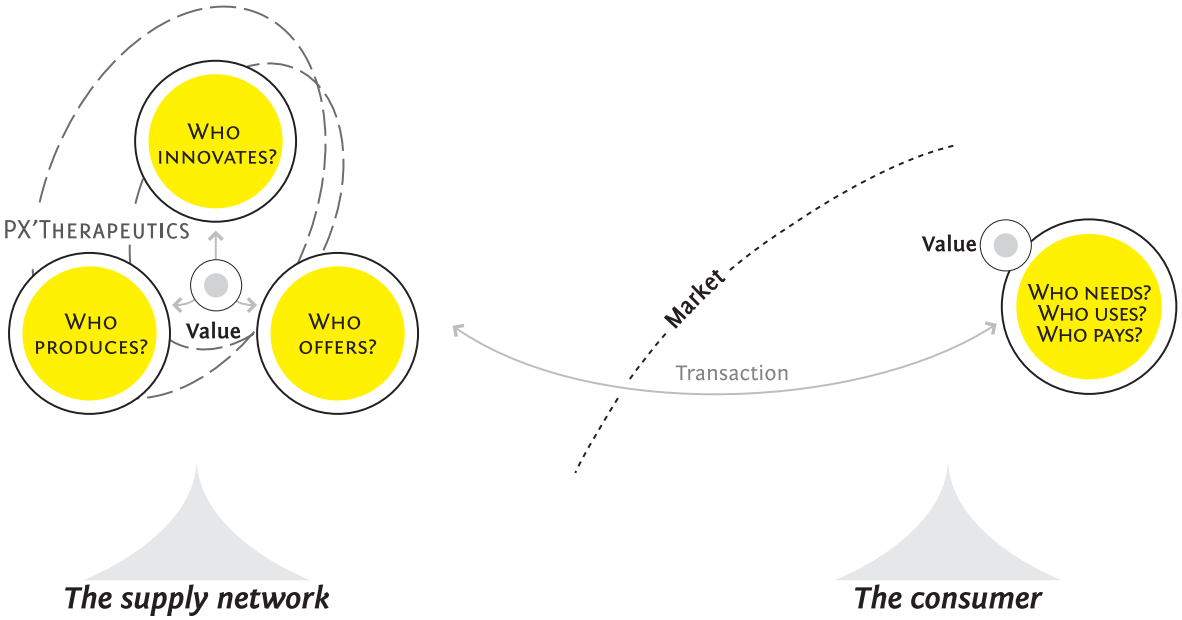

Fig. 5: A value proposition in an offer network

The value proposition is mainly found in the implementation of innovation in production and distribution. The value is based on a combination of cost-reduction logic, increasing the value of the offer, efficiency and performance, etc. This can in turn have economic impacts on the supply network. There can also be repercussions on the final demand if the characteristics of the products or services offered are modified sufficiently to generate new needs and / or uses which can in turn generate value through clients being willing to pay enough for them. The case that best illustrates this configuration is definitely the **PX'Therapeutics** case where, in the context of managing a portfolio of Business Models, the question of the creation of value propositions in an industrial network can emerge (in this case the biotechnology pharmaceutical industry). It is worth noting that the potential for creating value will be lower or higher, and also more or less risky, depending on the activities being impacted by the innovations, namely: [1] discovery and development, [2] process optimization and [3] the organisation and development of knowledge,. In the above figure **PX'Therapeutics** can be positioned behind the three *"Who?"* questions depending on the strategy developed by the company. This case highlights, above all, the strong relationship between potential value propositions and the value capture strategy, which can be more or less beneficial for the innovating company. In the case of **PX'Therapeutics** we can consider that each value proposition is associated with a value capture strategy depending on whether it involves a closed or an open platform. As indicated above, the dynamics of Value Proposition versus Value Capture are directed linked to a strategy aiming to get out of the highly competitive context of a given sector in order to move towards a less aggressive environment.

When the "user" is not the "payer"

Another significant evolution, and certainly a more radical one, is the separation of the user of the innovation from the person (or entity) that finances the value proposition. The **Sportganizer** case is typical of this type of value proposition where the needs and uses are definitely on the user side (sports clubs and their members), but it is business "sponsors" who finance the offer developed by **Sportganizer**.

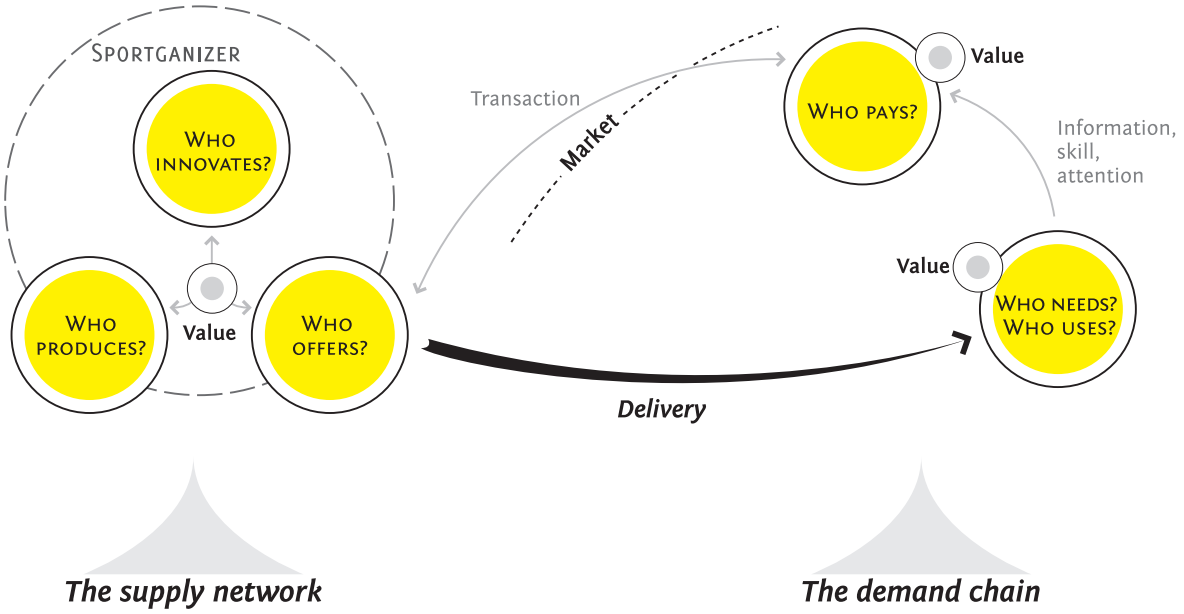

Fig. 6: A value proposition built on a "demand stream"

Though this case is different from YouTube, Facebook, etc ... in that it is not currently based on a logic of sending commercial messages to users, there is a logic where users can satisfy their needs through the free use of a web service that is funded by a third party, namely corporate sponsors. This case shows that the value proposition is made to both sportsmen and women and to their clubs, by providing a tool to facilitate the organization of sports events (but without providing sufficient monetary value for **Sportganizer**, the "market" for this company stops here), and business sponsors who benefit from the "attention" of qualified potential users of their brands. In other words, the value proposition splits: a proposal for the users side of a web service and a proposal that addresses primarily third parties, who is far from being at the origin of the needs and use of the solution proposed by the innovator. This is one of the fundamental characteristics of "double-sided markets" where the logic of generating revenue is based on the existence of cross-network externalities (Eisenmann and al. 2006). In these configurations, where the value of goods on one side of the market increses according to the number of users on the other side, the value capture for the innovator (usually a platform which interfaces the the two market sides) depends essentially on the sensitivity of the demands with respect to prices. It is in the platform's interest to generate revenue on the market whose price elasticity is the lowest. In the **Sportganizer** the logic goes as far as "subsidising" (or rather sponsoring in this case) the use of the sportsmen and women and their clubs by means of the "paying side" represented by corporate sponsors (for a more detailed analysis see Parent & Chanal, 2009)

Towards value propositions disconnected from users

The cases of **Schneider Electric** and **Eveon** both illustrate another phenomenon radically new as far as value proposition is concerned. Here the value propositions are based largely on players who do not use the technology proposed by the companies (see Figure 7). Ultimately, we can even consider that the users of innovative products are "myopic" in that they do not express any particular need nor willingness to pay. In reality, the needs - and the monetary value of the offer - are at the level of other players. For Schneider, this is primarily for managers in charge of building operations (who can reduce their costs through the Calorie device), while for Eveon, the device is largely funded by public national health services (public) and private insurance. In the case of Schneider, the government may even be interested in the offer and willing to subsidize it, given the interest in developing a virtuous energy policy.

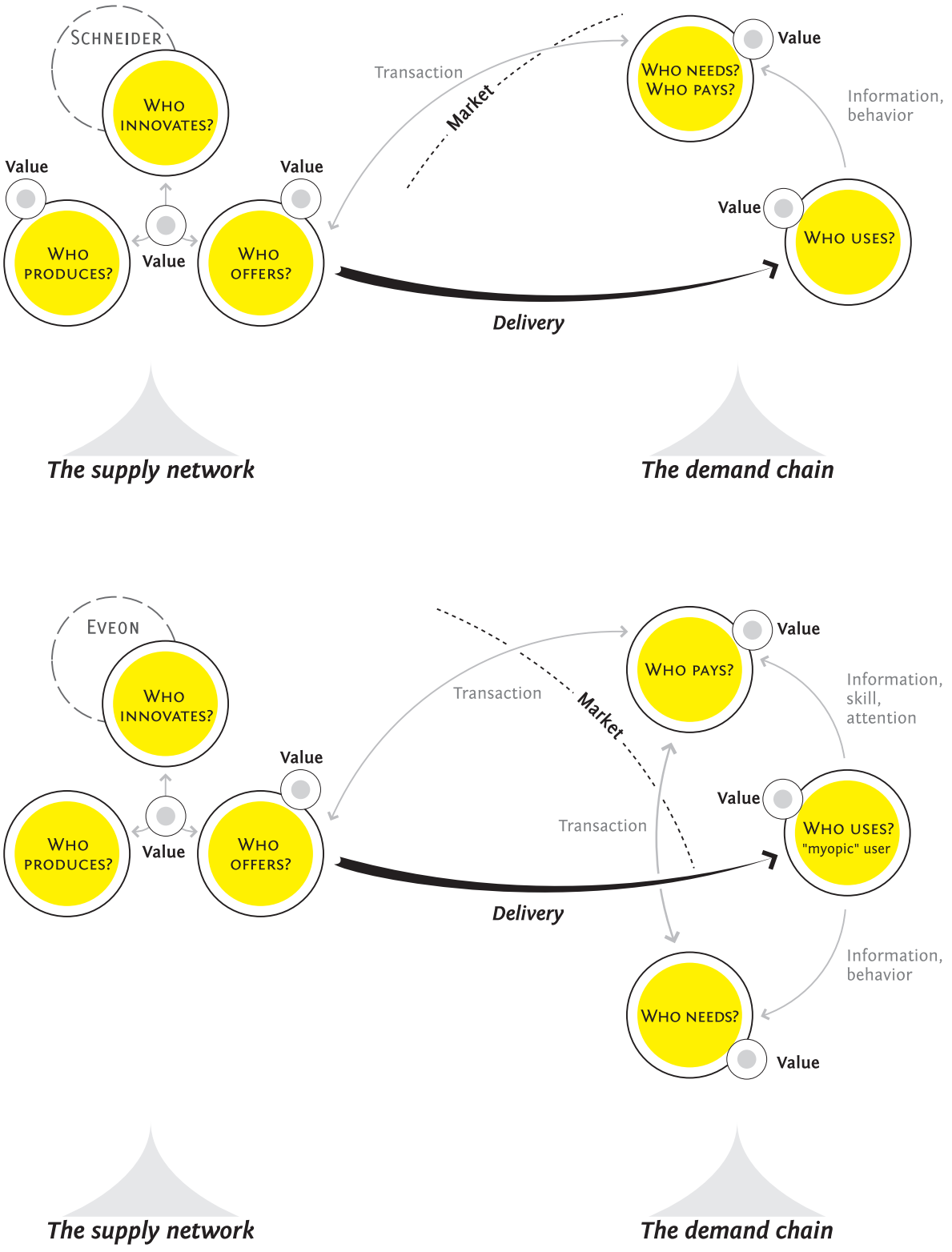

Fig. 7: A value proposition built on the basis of a "demand network"

But these two cases illustrate above all the number of value propositions for groups of actors often a long way from the end user. This is summarized in the following table:

Schneider Electric	WHO?	VALUE
	Who uses: The residents	Ecological benefits, cost savings
	Who offers: Installers	Differentiation strategy, easier maintenance
	Who needs and pays: Building managers and public administration	Reduction of running costs, economies of energy
	Who produces: HVAC manufacturers	Sale of software parameters
EVEON	**WHO?**	**VALUE**
	Who uses: Nurses and patients (at home)	Safety and ease of use
	Who offers: The pharmaceutical laboratories	Savings on volumes of expensive drugs
	Who needs: The prescriber i.e. doctors...	Elimination of risks
	Who pays: National health services (public) and private insurance	Self-administration at home, shorter hospital stays

Table 3: Schneider Electric and Eveon with a multiplicity of actors and value propositions.

In this configuration, the question of value capture becomes particularly complex. Not so much due to the number of players and value propositions throughout the ecosystem, but above all due to the need to develop and manage the diversity of the actors involved and their different revenue models which have to be implemented. For example, in both these cases, the public sector actors clearly have an interest in both offers: an economic interest (ex. national health services for Eveon), a collective interest (ex. government level in the case of Schneider Electric as regards energy savings) as well as interests that may provide value for innovative companies.
For this type of actor, value capture models are based on very specific levers such as accreditation / certification and / or grants. Simultaneously, and in both cases, it also involved setting-up viable models to capture and share of income between the private sector actors involved in the value network. This concerned the installers and building managers for **Schneider Electric** and the pharmaceutical laboratories and prescribers for **Eveon**. But another lesson from these two cases involves the methodology to be implemented when developing the value proposition. In both cases, the construction of the value proposition and its deployment over the ecosystem by the innovative company requires considerable work and effort in developing and explaining the revenue models of other players. In other words, the ability of both companies to generate relevant value propositions is largely based on analysis of the revenue models that do not concern them directly!

Towards dynamic co-construction of value propositions with users

The final value proposition configuration, illustrated by the **Predictys** case, corresponds to the end of the separation between supply and demand. In this case we can talk of a truly innovative network where users are directly involved in the value proposition offered by the innovator.

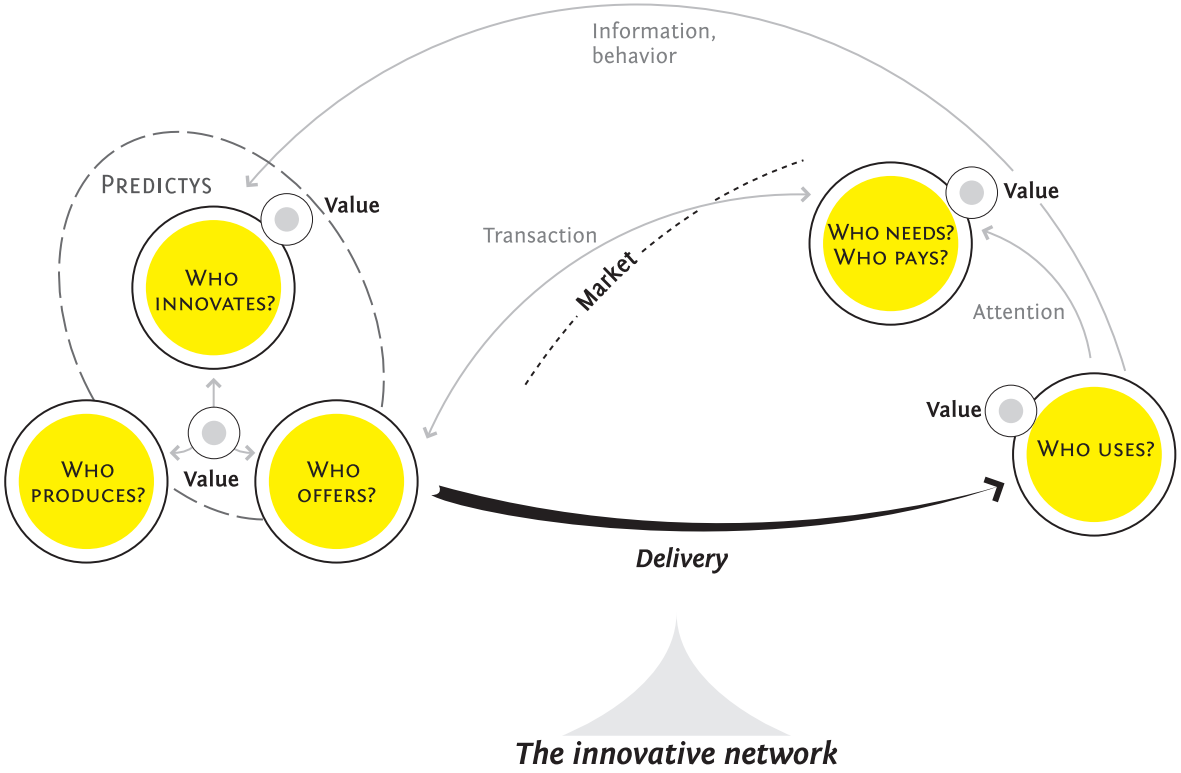

Fig. 8: A value proposition based on an "innovation network".

In this configuration, the actor who innovates benefits from value creation through the adoption of the product or service by the users. In other words, the border between demand and supply disappears in the sense that demand contributes directly to the dynamic content of the offer all throughout the product life cycle (as opposed to being limited to user participation only in the initial definition of the offer). Also, having a more precise knowledge of the subscribers, Predictys can target messages with greater precision. This value proposition was initially of interest to advertisers and web agencies, and the skills developed by the company through its close relationship with the Internet users via its own newsletter now allow it to consider adopting the role of editor.

The **Predictys** case shows especially that beyond the traditional cross-externalities found in two-sided markets, the activities of the sponsored-side can also lead to improvement and enable diversification of the platform's value proposition on the paying-side (money-side). This phenomenon has not been studied, or only poorly, in literature in this field to date. Indeed, through capitalization and the use of information on Internet users' behaviour, Predictys was able to develop new value propositions which in turn enabled it to "bump" itself up the value chain to the role of publisher. This case is certainly part of a dynamic analysis of two-sided markets yet to be discovered by the academic world but also by the practitioners.

Conclusion

How does a market emerge? Did we answer this question? Certainly not! Our project was less ambitious; it was to identify some stages of what has to be done based on the cases presented in this book.

A market is the first meeting of a value proposition and a bunch of client values. As in many love stories, this first meeting is unclear. Indeed, love at first sight is very rare!

The innovative company has to work extensively to tailor its proposition to the values requested. The innovator must identify and highlight all the benefits that the application can provide to the user of its offer. Sometimes the company will be

surprised by the order in which the customers put these benefits.
During this exploration phase, it is equally important to anticipate the value network, which is made necessary by the complexity of technologies and business structures. Here, there is no ambiguity: the only criterion is the value capture.
All this, innovators discover "as they walk". Perhaps they would gain time, and make fewer errors, if they had a good toolbox, and if they had the curiosity to wonder how others are doing.
If they were clearly aware of this from the outset, would innovators launch themselves into this kind of venture with the same enthusiasm?

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Rethinking Business Models for Innovation

Lessons from entrepreneurial projects

EDITED BY VALÉRIE CHANAL

One of the major challenges confronted by those in charge of technological innovation involves anticipating the value creation model sufficiently early on, in a highly uncertain context both as far as the technology itself is concerned and the potential market.

Today, in many industrial sectors, the innovation boundaries have moved towards projects that are more and more exploratory and fuzzy. The simple optimisation of linear processes of the "stage-gate" type is no longer sufficient to build sustainable competitive advantages.

The notion of Business Models, when applied to innovation, enables us to describe how a company creates value through innovation, generally within a business ecosystem, and how the value will be distributed between the actors involved. The authors of this book believe that the notions of Business Modelling and value creation are key to all the dimensions of successful innovation, whether technology, marketing, organisational or economically based.

Rethinking Business Models for Innovation: this title describes the relationship between thinking, modelling, and also field-testing. The book is based on a series of nine recent cases of innovation involving company managers, often assisted by researchers (the co-authors of each chapter), and how they built and formalised their Business Models and then tested their strategies.

After having discovered the variety of the cases, the reader will understand that every innovation situation generates specific questions about Business Models. However, we feel that we can identify three key issues that arise, more or less, in each of these projects. The chapters in this book build on these issues: the identification of sources of value and revenue models (the notion of value creation), the position of the company in the value-network or ecosystem (the sharing of value) and finally the evolution of Business Models over time (the sustainability and the competitiveness of the company). The last chapter goes over all the contributions, exploring the notion of value in the Business Model approach.